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CLINICAL STUDIES IN FEEBLE-MINDEDNESS

BY

EDGAR A. DOLL

*Assistant Psychologist, The Training School at
Vineland, N. J.*

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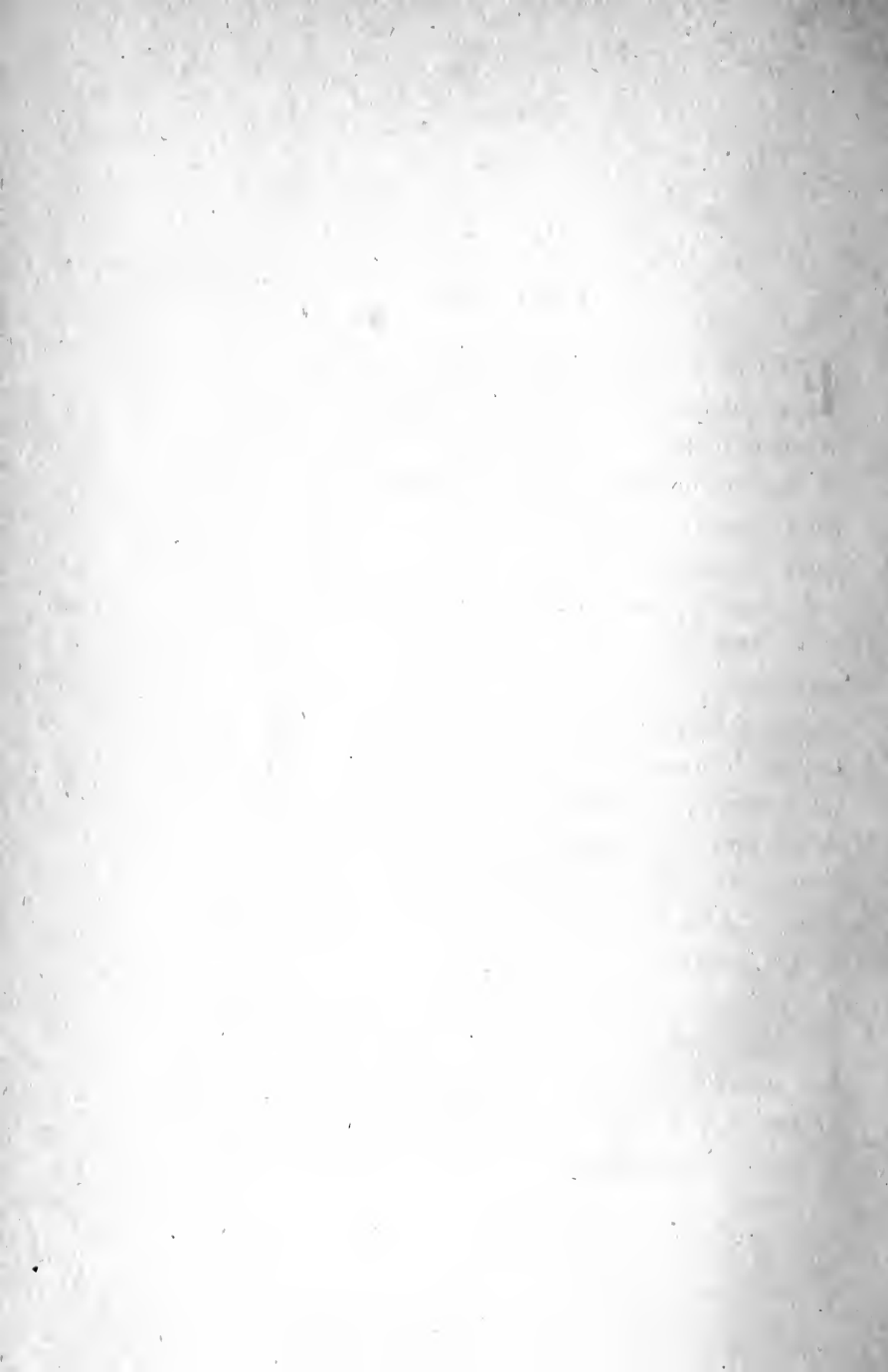
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TO
HENRY HERBERT GODDARD,
PRECEPTOR AND FRIEND,
WHOSE GENEROUS COUNSEL AND BROAD VISION
HAVE BEEN BOTH GUIDE AND INSPIRATION,
THIS BOOK IS
GRATEFULLY INSCRIBED



PREFACE

FEEBLE-MINDEDNESS is a leading social problem which insistently claims the attention of all branches of social science. With the passing of the notion that political equality signifies intellectual equality in our democratic society, we have come to realize that many types of social failure are caused by mental incapacity, by inability instead of by unwillingness to conform to the current social standards. The newer pedagogy demands that instruction and the course of study be adjusted to the pupil's individual learning capacity. The newer philanthropy recognizes that former charity has dealt only with symptoms and not with causes. Courts and penal and corrective institutions are rapidly adjusting legal and personal responsibility to individual mental capacity.

The recent researches into the causes of juvenile delinquency and of recidivism agree that at least a fair quarter of young offenders and a much higher percentage of repeating offenders are mentally defective. The advanced school administrator has

established special classes for those public school children who are so feebly endowed with intelligence that they cannot possibly profit from the ordinary course of study and ordinary teaching methods. Studies in vocational guidance have startled us by reporting that probably twenty-five per cent of children who leave school early to begin work are not of normal or even dull normal intelligence levels. An almost equally high percentage of orphan and dependent children will never "grow up" mentally. A very high percentage of professionally immoral women and of confirmed criminals are morons or imbeciles.

These facts have been the outcome of experiment and scientific investigation. Far from being the product of vivid or morbid imagination they are the conservative and respected conclusions of our leading psychologists, educators, sociologists and eugenists. And yet the scientific study of feeble-mindedness is only ten years old. The closing year marks the end of the first decade in the history of the first laboratory devoted solely to the study of feeble-mindedness. Aside from the comparatively few experimental studies preceding this period, most of the realization of the social significance of mental defect has developed within the last five years.

It is inevitable that some confusion of ideas and many differences of opinion should prevail at the end of so brief a period in a field where so much has been done, almost over night, in subject-matter of such fundamental importance. It is inevitable that there should be some disagreement in terminology, definitions, criteria, and methods when the pressing need for workers has forced into service many comparative laymen and immature students. It is therefore fitting that we "take thot unto ourselves" and make an inventory of the stock on hand. Some of the criteria of feeble-mindedness have been vague, and need elucidation; some have been confused, and need clarification or rationalization; and some have been actually incorrect, and need elimination.

I did not set myself the difficult task of achieving these three ends. The clinical study of borderline and exceptional cases of mental defect has led me to undertake a critical evaluation of the several criteria of feeble-mindedness which are commonly employed in mental diagnosis. The exact worth of each of these criteria and their combinations has not been subjected to the rigid inspection which is necessary for scientific method, nor have the specific values of their claims to attention been challenged.

In this book I have presented the major diagnostic criteria of feeble-mindedness and the corresponding clinical methods, and have examined the real contribution of each to individual diagnosis, both clinically and theoretically. The manuscript was originally composed for those who are studying feeble-mindedness in any of its many ramifications. It was first prepared as a technical contribution designed to answer some of the puzzling questions which arise in clinical mental diagnosis. The need for such a work has been voiced by many students of the subject and by diagnosticians in many fields of applied psychology and sociology. Perhaps this attempt to meet that need may in a measure assist those who are championing the cause of gifted children, as well as those interested primarily in feeble-mindedness, for in many ways the two fields of work are closely similar.

The reader may observe two faults in the presentation, the first that the statements appear dogmatic, and the second that the argument merits more copious elaboration. I am conscious of these defects, which, however, may also be advantages. I have consistently resisted the desire to follow up the several implications of the criteria discussed, in spite of the great significance of these implications

for pedagogy, for psychology, and for medical and social science. In presenting a technical exposition of a broad field in narrow compass I did not feel at liberty to develop the argument at greater length than was essential to clearness. This elaboration is, however, effected in some degree by the use of copious illustrations and a rather comprehensive reference bibliography.

I have hoped that the work will prove helpful to instructors of students engaged in the study of feeble-mindedness, and for those preparing as teachers of mental defectives. In my own teaching experience with such students I have long felt the need for a satisfactory text-reference. This book is not constructed after the plan of the usual type of class-room text-book, but may be used as a lecture text. The absence of elaboration is thus an advantage to the instructor, for it allows him ample opportunity to develop the text in his own way and according to his own experiences. The detailed references and representative bibliography afford material for student practice in library follow-up, and at the same time permit of considerable choice of reading material. The illustrations represent concrete material, such as cases, types, and field trips. When used in this way the book may meet a real

need, and may be an effective assistant to both student and instructor.

A glossary of terms and a glossary of tests are appended for the use of readers not professionally versed in clinical psychology. The glossary of terms is intended to make clear the specific meanings of certain terms as used technically in the main text, and is in part an interpretation of current usage for those terms which are of unstable definition at the present time. The glossary of tests consists of brief statements regarding the general nature and purpose of the mental tests referred to but not described in the main text, and especially of those mental tests which are of comparatively recent development or of less general familiarity.

It is hardly possible to make adequate acknowledgment of the sources from which I have secured aid. The bibliography itself must be my witness of this. But in particular my personal thanks are due Dr. Henry H. Goddard for previous years of preparing me for such an undertaking, and to Miss Flora Otis for most unselfish assistance in compiling references and for many helpful suggestions and corrections in the manuscript.

EDGAR A. DOLL.

Vineland, December, 1916.

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PART I
DIAGNOSTIC CRITERIA

THE SOCIETY OF MINDS

OFFICIAL STATEMENTS

The Society of Minds is a non-profit organization dedicated to the advancement of human knowledge and the promotion of intellectual freedom. We believe that the pursuit of truth is the highest of human endeavors and that the free exchange of ideas is essential to the progress of our species.

Our primary mission is to support and encourage the work of independent scholars and researchers who are committed to the highest standards of academic excellence. We provide financial assistance, research facilities, and a platform for the dissemination of their findings. We are particularly interested in work that challenges established dogma and explores new frontiers of human thought.

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CLINICAL STUDIES IN FEEBLE-MINDEDNESS

CHAPTER I

INTRODUCTION

THE past few years have witnessed an astonishing increase of popular and scientific interest in the feeble-minded. This interest has developed so suddenly and so widely that the increase of knowledge and the establishment of methods, criteria, and terminology have not kept pace with the new developments. Consequently there is considerable difference of opinion as to what feeble-mindedness is, how it may be recognized, and especially who may be properly included under that term. It is the purpose of this book to set forth and evaluate some methods of differentiating this condition from normal mental states. The aims are three: first, to indicate the several points of view from which feeble-mindedness may be defined, and to formulate corresponding definitions; second, to show what criteria

may be used in the differential diagnosis of mental defect; and third, to evaluate the examinational data of the different points of view. Clinical data on a variety of cases will be presented in support and in illustration of the arguments.

Much of the confusion now prevailing in the different conceptions of feeble-mindedness is caused by failure to discriminate between superficial manifestation and fundamental basis. In 1913 Gesell pointed out that mental defect may be defined from four points of view, and that the point of view determines the definition (31, p. 12).¹ As a matter of fact, since each branch of science tends to describe its subject-matter from its own point of view, there may be as many descriptions of mental defect as there are branches of science interested in it. It is our purpose to discuss some of the criteria on which these descriptions are founded, in order that these several points of view may be more clearly recognized and differentiated than heretofore. We shall content ourself with developing only those criteria which are now recognized as of major importance.

¹ Numbers in parentheses refer to the list of appended references.



PSYCHOLOGICAL TYPES OF FEEBLE-MINDEDNESS

UPPER LEFT. High-grade idiot, twelve years old with mental capacity of two years. Case 150 in Goddard's *Feeble-mindedness* (reference 34).

UPPER RIGHT. Low-grade idiot, ten years old with mental capacity below one year. Case 118 in Goddard's *Feeble-mindedness*.

LOWER LEFT. Low-grade imbecile, nine years old with mental capacity of three years. Case 109 in Goddard's *Feeble-mindedness*.

LOWER RIGHT. Low-grade imbecile, twenty-two years old with mental capacity of three years. Case 127 in Goddard's *Feeble-mindedness*.



CHAPTER II

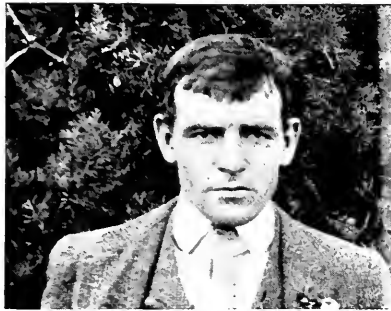
CRITERIA AND DEFINITIONS

THE PSYCHOLOGICAL CRITERION. Feeble-mindedness is now recognized as a condition of *arrest of mental development*. This is the court of final appeal. No matter what the immediate manifestation of mental defect may be, whether, for example, social inefficiency or physical and physiological degeneracy, the ultimate diagnosis of feeble-mindedness depends first upon the proof of *mental subnormality*, and second upon the provision that this is *due to arrest of development*. No person can be considered feeble-minded unless he gives evidence of these two conditions, no matter what abnormalities he may exhibit. The synonyms for feeble-mindedness and the etymology of the designating terms for the grades of defect all testify to the importance of this criterion. Further proof is found in the fact that all other criteria specify and include the psychological.

Binet and Simon, in 1905, first showed that feeble-mindedness is specifically a defect of the general intelligence or judgment, and gave

Esquirol the credit for being the first to make this important distinction (5, pp. 15 ff). Other French writers recognized the condition as a defect of mind, but emphasized specifically the will (85), or the attention (86). Both Itard (51, 63) and Seguin (84) emphasized the underlying physiological basis of mental defect. More recently, Abelson concluded that "backwardness" is a defect of the attentive consciousness or "clear awareness" (1). At present the weight of opinion seems to consider the psychological aspects of feeble-mindedness as the most important, but recognizes the underlying physical basis (5, 6, 39, 64, 77, 104).

From the psychological point of view, then, feeble-mindedness is defined as *a condition of arrested development, specifically of the general intelligence, which limits the individual to mental capacity not exceeding that of 12-year-old normal children*. This conception arises directly from results obtained by use of the Binet-Simon Scale, from which it has been found that the highest "mental ages" of institution cases rarely exceed 12 years (5, p. 146; 36; 79). With the extension of the Scale for more satisfactory measurements of the higher years, it may be necessary to modify the present limit of 12 years. In terms other than



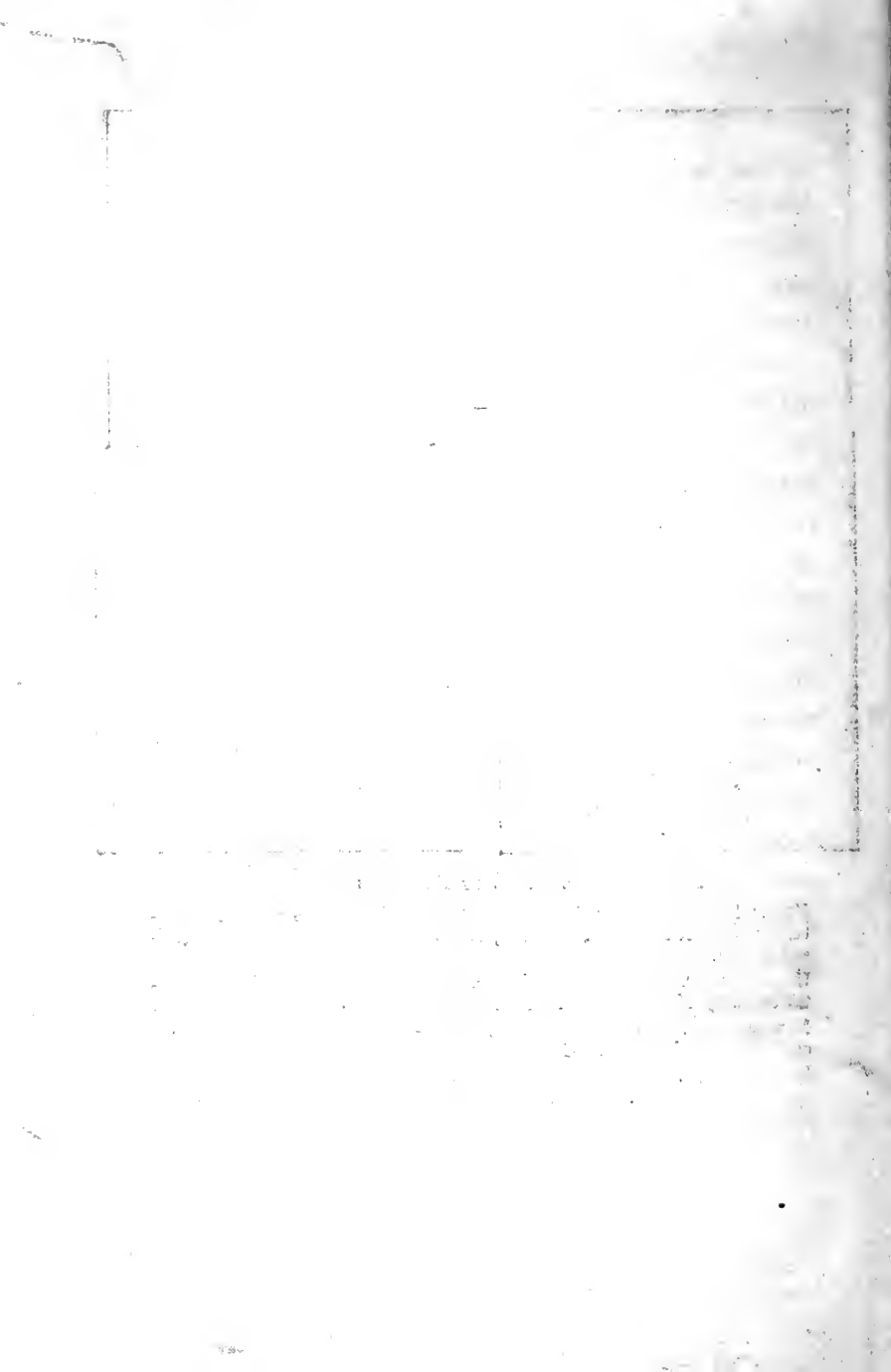
PSYCHOLOGICAL TYPES OF FEEBLE-MINDEDNESS

UPPER LEFT. High-grade imbecile, twenty-eight years old with mental capacity of six years. Case 85 in Goddard's *Feeble-mindedness* (reference 34).

UPPER RIGHT. High-grade imbecile, twenty-seven years old with mental capacity of seven years. Case 207 in Goddard's *Feeble-mindedness*.

LOWER LEFT. Low-grade moron, thirty-two years old with mental capacity of eight years. Case 45 in Goddard's *Feeble-mindedness*.

LOWER RIGHT. Middle-grade moron, sixteen years old with mental capacity of ten years. Case 10 in Goddard's *Feeble-mindedness*.



mental age, feeble-mindedness is *mental incapacity for adaptation to environmental demands*. It is essentially the absence of good judgment in the ordinary affairs of life. This gives rise to the social criterion.

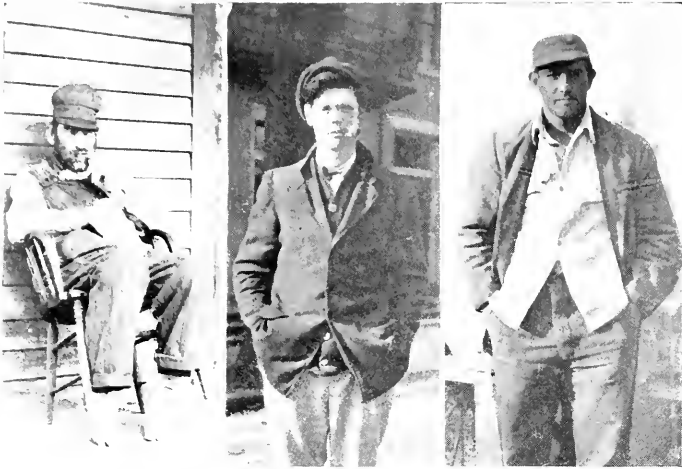
THE SOCIAL CRITERION. Altho mental subnormality is the fundamental differentiating characteristic of the feeble-minded, social inefficiency is at present prerequisite, and is the most important practical manifestation of the condition. According to current usage no person can be termed feeble-minded unless he can be proved socially incompetent as well as mentally inferior. Not all social incompetents are feeble-minded, but all feeble-minded are either actual or potential social incompetents. The difficulty here lies in the uncertainty of the social standard. We must not fail to recognize, however, that social inefficiency is a superficial manifestation and not the fundamental basis, and does not preclude other concepts (15). As Tredgold expresses it, "The condition is a psychological one although the criterion is a social one."

The social definition has previously received the most attention, and naturally, for feeble-mindedness was first recognized on a large scale because of its relation to social problems. For this point

of view we may accept the definition set up by the British Royal Commission on the Feeble-Minded, at the suggestion of the Royal College of Physicians of London. This Commission defined the feeble-minded as, "persons who may be capable of earning a living under favorable circumstances, but are incapable from mental defect existing from birth or from an early age (a) : of competing on equal terms with their normal fellows; or (b) of managing themselves and their affairs with ordinary prudence" (82, p. 188).²

Tredgold originally defined amentia as, "a state of mental defect from birth, or from an early age, due to incomplete cerebral development, in consequence of which the person affected is unable to perform his duties as a member of society in the position of life to which he is born" (20, p. 2). It is interesting to note that Tredgold includes "incomplete cerebral development" as well as "mental defect." He also considers social success in reference to "the position of life to which he is born," thus rendering the already vague social standard

²It should be noted that in this definition "feeble-minded" is synonymous with the American term "moron." The Royal Commission defined amentia only by the separate grades and gave no definition of the generic group. For American usage see (79) and glossary.



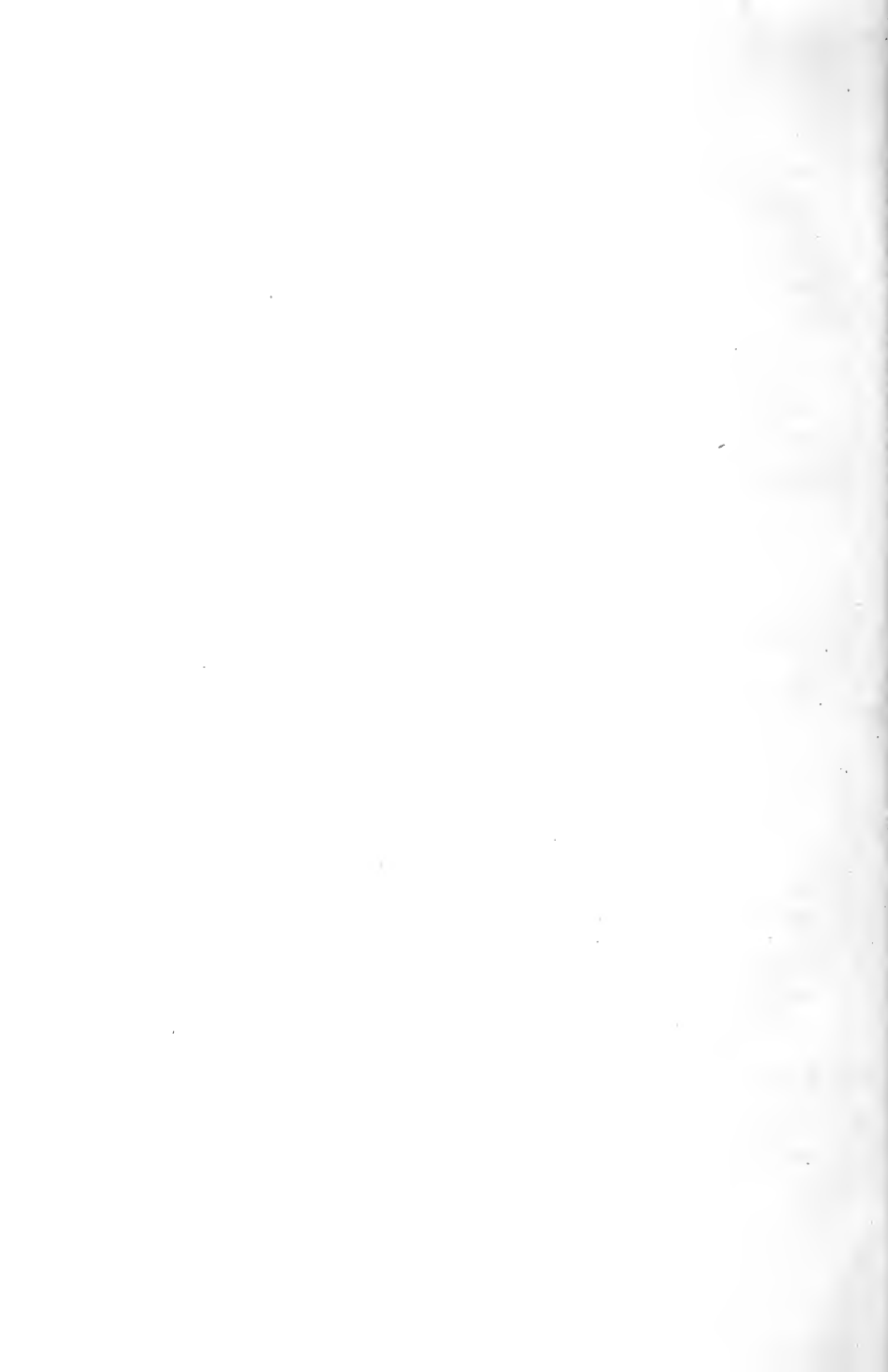
SOCIAL TYPES OF FEEBLE-MINDEDNESS

Men who "cannot compete on equal terms with their fellows" nor "manage themselves and their affairs with ordinary prudence."

LEFT. This man was photographed outside the bar-room of a country hotel. He is the butt of the local "horse-play." He depends on the charity of the villagers for food and shelter, or "lives off the country." He is a low-grade imbecile, too low-grade to be a serious menace to the community.

CENTER. This young man hardly answers to David Starr Jordan's description of a good citizen as "one who can take care of himself and has something left over for the common welfare." He is not criminalistic by nature but by reason of inferior intelligence and poor judgment has a reformatory and prison record. He is a low-grade moron with a mental age of nine years. He can earn a fair wage at simple work, such as grocery boy or painter's assistant, but his industrial record is typical of a moron's inability to remain steadily at work except under supervision. He has no appreciation of accepted marital conventions, tho he is not wilfully immoral. He was arrested for bigamy, but the charges were dropped when it was proved that his supposedly legal wife herself had a previous husband, altho he too had a previous legal wife. His helplessness in this plight was as ludicrous as it was serious.

RIGHT. Vicious type of feeble-minded social offender. At the time of the picture he was serving a prison sentence for stealing. When this prison term had expired he could not remain socially responsible long enough to travel the fifty miles to his home, but was rearrested for gross and unprovoked assault. He is the son of feeble-minded parents, and is a low-grade moron of mental age eight.



still more indefinite. In his later work Tredgold defined amentia as, "a state of restricted potentiality for, or arrest of, cerebral development, in consequence of which the person affected is incapable at maturity of so adapting himself to his environment or to the requirements of the community as to maintain existence independently of external support" (104, p. 8). This definition, by including cerebral development and incapacity for adaptation, contains the medical and the psychological criterion as well as the social.

Binet and Simon recognized the social criterion of feeble-mindedness and made it the differentiating threshold between normality and the highest grade of feeble-mindedness. They wrote, "There remains a third limit to establish—that which separates morosity from the normal state. This is more complicated; we do not consider it fixed but variable according to circumstances. The most general formula that one can adopt is this: an individual is normal when he is able to conduct himself in life without need of the guardianship of another, and is able to perform work sufficiently remunerative to supply his personal needs, and finally when his intelligence does not exclude him from the social rank of his parents" (5, p. 266).

A serious limitation of the social criterion is its variability in time and place according to the relative complexity of the social structure. Social adjustment becomes more and more difficult as society evolves. The ability to make these social adjustments is a direct expression of mental capacity, and the success with which the adjustments are made is the social criterion of normality or of feeble-mindedness. But because social adjustment is the primary criterion of mental defect, all other criteria of mental defect must vary as the social standards change in societal evolution. There is, therefore, no absolute or fixed standard of feeble-mindedness. A three-fold criterion must be employed, namely, *social inefficiency due to arrested mental development*. All other criteria must be constantly readjusted to the standards set by the social conventions, and must include mental subnormality which has been caused by arrested development.

THE PEDAGOGICAL CRITERION. In an environment of established school systems scholastic ability is a measure of mental capacity, particularly among children, and feeble-mindedness may therefore manifest itself through scholastic deficiency. In spite of every educational advantage a person of limited mental capacity is proportionally limited in scholas-



SOCIAL TYPES OF FEEBLE-MINDEDNESS

LEFT. Mag and her two children at the almshouse. She was able to count the number of her children so long as she had no more than ten, but was very much at a loss when the arrival of the eleventh taxed her number sense beyond its narrow limits. This woman and her social life are vividly pictured in reference 59.

RIGHT. Feeble-minded family picking cranberries. Individual feeble-minded pickers *can* earn as much as two or three dollars a day at this work, but a little money soon allays their working enthusiasm. The girl at the left, Becky, is an attractive moron who is a center of immorality (or a-morality) wherever she makes her temporary abode. Her marital relations are described in reference 58. The girl in the center is the mother of the children shown opposite page 54. The girl at the right is the third wife of the man described opposite page 24; he was married to her by a minister while his two other wives were still living and undivorced. The little girl in the center is the daughter of the girl in the back center. She is the same girl shown opposite page 54, taken four years later.

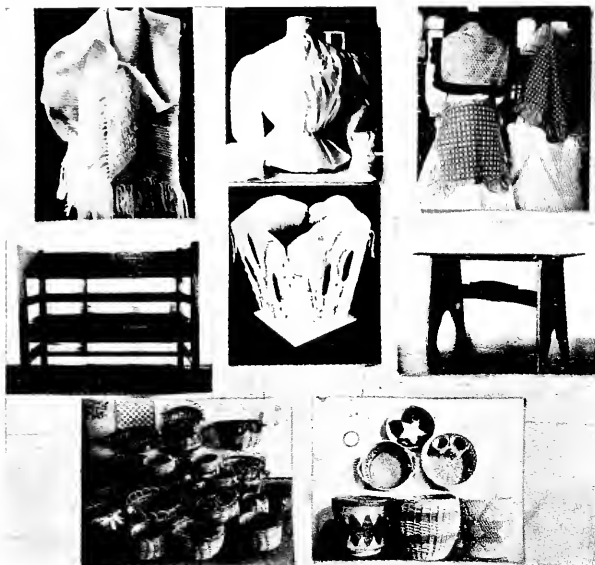


tic accomplishment. Consequently there has arisen a pedagogical significance of feeble-mindedness which among children may be substituted for the social criterion applied to adults. Only the highest grades of mental defectives can learn the three R's effectively. Binet and Simon once classified the grades of feeble-mindedness on this basis and claimed that, roughly, idiots cannot talk, imbeciles cannot read or write, and morons cannot deal with abstractions (5, pp. 145, 266; 7, p. 77). We now know that there is a definite correlation between mental ability and school success, not perfect, but very high (25). Pedagogically, therefore, the feeble-minded are "those who cannot be taught to read, write, or cipher, with any marked advantage to themselves or society" (31, p. 12), or, those who are not able to accomplish satisfactorily more than the first five grades of a standard primary school course.

It is interesting to note that in England the definition of mental defectiveness in children is based upon the pedagogical criterion. The Act of Parliament in 1899 designated feeble-minded persons under sixteen years of age as, "those children who . . . not being merely dull and backward, are defective—that is to say, by reason of mental (or

physical) defect are incapable of receiving proper benefit from the instruction in the ordinary public elementary schools . . ." (104, p. 157). The Mental Deficiency Act of 1913 made use of the same criterion, and defined feeble-minded children as, those who "by reason of such (mental) defectiveness appear to be permanently incapable of receiving proper benefit from the instruction in ordinary schools" (116, p. 102). Again we note that "feeble-minded" in England commonly means high-grade ament (American "moron").

THE MEDICAL CRITERION. The earliest students of feeble-mindedness were men of medical training with pedagogical purposes. It is not surprising that the medical point of view should have dominated until recently. According to commonly accepted medical theory and practise feeble-mindedness is a *disease* (28, pp. 2 f.; 50, p. 1; 84, p. 29), altho some medical authorities have held to the opinion that feeble-mindedness is a *defect*, characterized, it may be, by a greater or less number of physical abnormalities, which are most pronounced in defects of the central nervous system (3, pp. 17-23). The criterion has never been definite, for unfortunately "medical" has been used in a variety of meanings to cover many of the allied medical sciences.

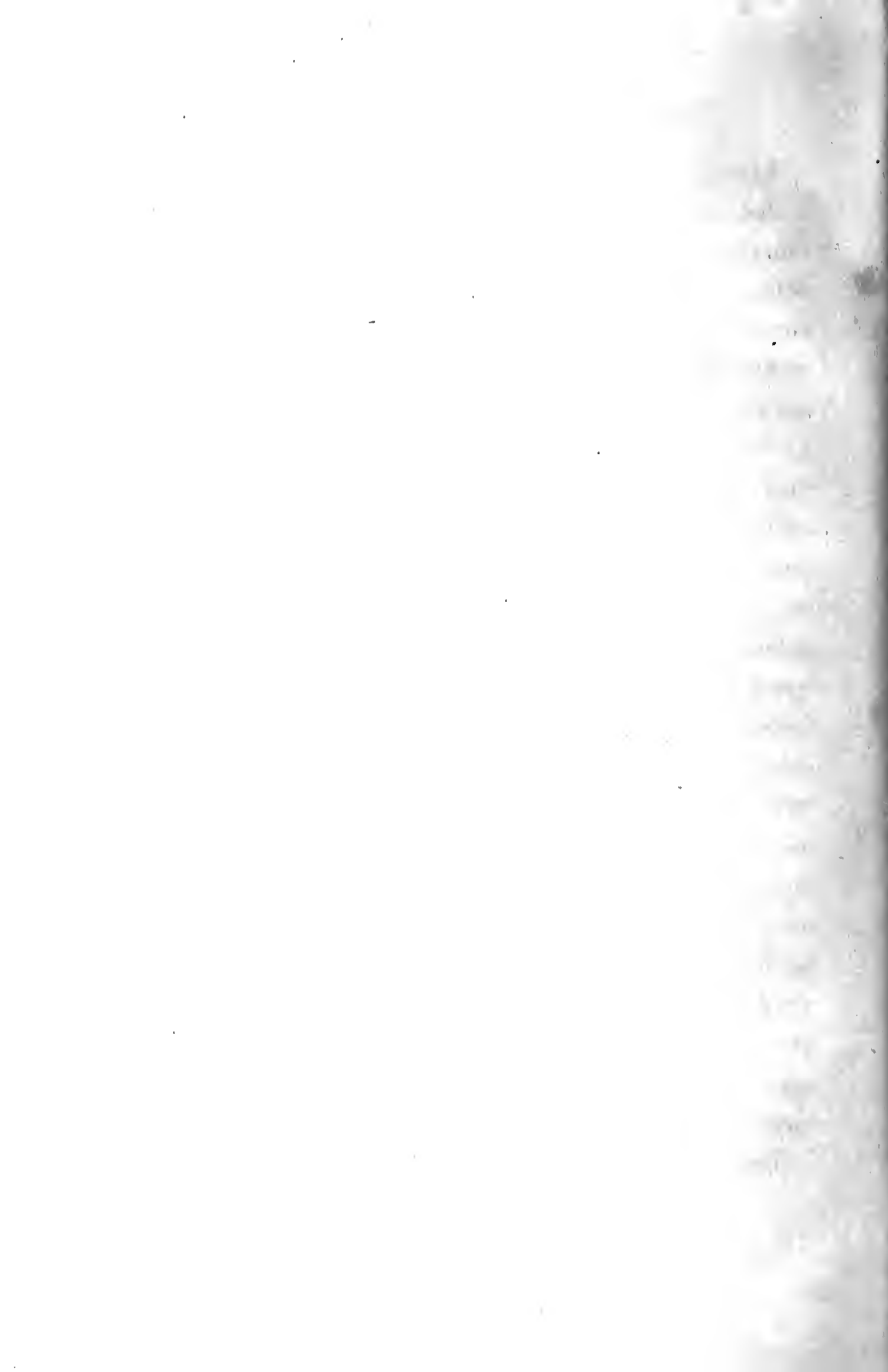


PEDAGOGICAL CAPACITIES OF THE FEEBLE-MINDED IN HANDWORK

TOP ROW. Sewing and knitting, which may be undertaken with prospect of elementary results by children of mental age seven, and which reaches a high degree of success with mental defectives of mental age eleven, after a period of instruction. These mental age limits were supplied us by Miss Eliza Randolph, in charge of this work at The Training School.

CENTER ROW. Woodwork, in which children of mental age seven can achieve acceptable results, and which is carried on with ease by those of mental age eleven, after a period of training. These mental age limits were supplied us by Miss Cora Warren, in charge of this work at The Training School.

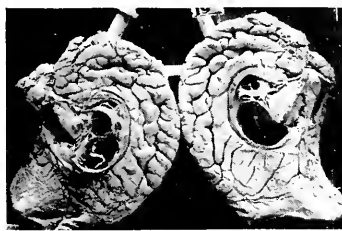
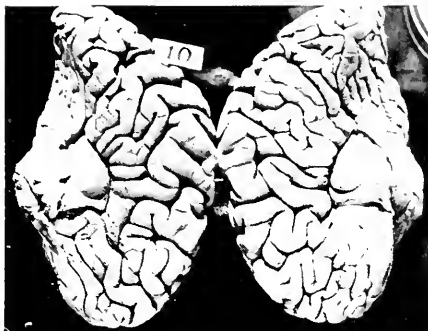
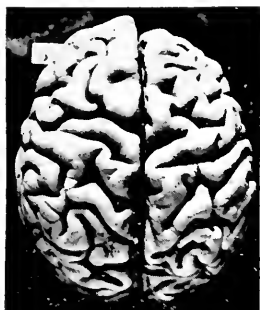
BOTTOM ROW. Basketry, reed and rafia weaving, in which those of mental age six are able to make simple pieces, and in which those of mental age ten can do nearly perfect work, after a course of training. These mental age limits were supplied by Miss Eva Kirk, formerly in charge of this work at The Training School.



Medically, then, feeble-mindedness is defined as a disease or defect of the central nervous system, especially of the brain. Tredgold says in his first definition, "a state of mental defect . . . due to incomplete cerebral development" (103, p. 2), and in his later definition, "a state of restricted potentiality for, or arrest of, cerebral development" (104, p. 8). This definition agrees with that of Gesell, that, "Medically, feeble-mindedness is a permanent, early arrest of the development of the nervous system, particularly of the brain cortex, or 'gray matter'" (31, p. 12). Unfortunately for the medical definition, no one has ever satisfactorily demonstrated, except for some pathological types of feeble-mindedness, that the lack of mental development is due to incomplete cerebral development. It seems logical to expect this, but the cerebral basis of the "higher" or complex mental processes is still only indefinitely determined, and a cerebral lesion or cerebral under-development of the feeble-minded remains only a probability (104, pp. 75 ff.). In spite of the fundamental importance of cerebral pathology in relation to feeble-mindedness, the subject has only a scant experimental literature (88).

There is, however, another field of medical sci-

ence, recently developed, which is of the utmost significance for mental deficiency. This is hemadenology, the study of the ductless glands in relation to metabolism, growth, and development (82a). The important aspects of this field in relation to feeble-mindedness are presented in the work of Sajous, who has insisted upon the absolutely fundamental importance of the ductless glands as primary causes of disturbances and arrests of physical growth and mental development. Sajous states that, "*any disease capable of injuring the ductless glands sufficiently to inhibit their functional activity impairs correspondingly the development and functional activity of the brain, by reducing the supply of secretions this organ requires to carry on these physiological processes*" (82b, p. 9). And he further concludes for hereditary types of mental defectives that, "*the main underlying cause of defective mentality in both parent and offspring is inherited deficient activity of the ductless glands*" (82b, p. 10). It is, therefore, in disordered metabolism, which has been caused by lesions, diseases, or functional inactivity of the adrenals, the thyroid, thymus, pituitary, pineal, and other ductless glands, that one may look for the primary cause of mental defect, and an explanation of both acquired ("accidental") and inherited feeble-minded-



GROSS CEREBRAL ANOMALIES IN PATHOLOGICAL TYPES OF FEEBLE-MINDEDNESS

Preparations from the psychopathological division of the Vineland Laboratory.

UPPER LEFT. Simplicity of convolutions in a low-grade paralytic imbecile. Case 285 in Goddard's *Feeble-mindedness* (reference 34). Age at death 44. Weight of cerebrum 906.5 g., left hemisphere 455.5 g., right 451.0 g.; cerebellum 122.0 g.; stem 25.6 g.; total weight 1054.1 g. UPPER RIGHT. Absence of corpus callosum in a middle-grade imbecile. Age at death 32.

LOWER LEFT. Hydrocephalic degeneration in a low-grade microhydrocephalic idiot. Total weight 712.1 g.; cerebrum 589.9 g.; cerebellum 98.7 g. Age at death 14.6.

LOWER RIGHT. Hydrocephalic degeneration in a low-grade, helpless, paralytic, microhydrocephalic idiot. The posterior lobes were totally disintegrated. Total weight 348.8 g.; cerebrum 264.3 g.; cerebellum 72.0 g. Age at death 21.

THE HISTORY OF THE

REIGN OF KING CHARLES THE FIRST

By JOHN BURNET
BISHOP OF SALISBURY
AND
OF THE CHURCH OF GREAT BRITAIN
IN PARLIAMENT ASSEMBLED
BY VIRTUE OF AN ACT OF PARLIAMENT
IN THE SEVENTH YEAR OF KING CHARLES THE SECOND
IN PARLIAMENT ASSEMBLED
PRINTED BY J. STURMANT, STATIONER AND PRINTER
TO HIS MAJESTY'S COLLEGE OF PHYSICIANS
IN GREAT BRITAIN
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edness, as well as a means of prevention and therapy of arrested mental development.

There is no need, for present purposes, to more than state Sajous' position and to point out the fundamental importance of this medical conception of feeble-mindedness. The main hypotheses and corollaries of this conception are entirely consistent with the principles and facts presented in support of the psychological, somatic, and hereditary criteria herein set forth. It may well be that these criteria furnish what will ultimately be a highly complex and elaborate syndrome for hemadenologists.

THE SOMATIC CRITERION. The newer physiological and allied medical and anthropometrical researches indicate that feeble-mindedness is associated with a more or less complete retardation of the entire organism, structurally and functionally, physically, physiologically, and anatomically, as well as mentally. Psychologically, mental defectives show general rather than specific retardation; the arrest of mental development apparently involves the coordinations, and the affective and the volitional processes as well as the intelligence. In psychogenesis all these mental processes normally develop coordinately, and it appears that in the arrest of mental development they are correlatively retarded. In height and in

weight and in psycho-physical measurements it has been shown that mental defectives exhibit a clear and definite tendency toward retardation (18). Biochemical studies further indicate that in metabolism and in nutrition this same tendency is evident (73, 74). From these beginnings there may ultimately be developed a criterion based on somatic or anthropological characteristics. At present this is only a fascinating theory, but from research along the lines of this hypothesis many important results might be expected. One such study seems to indicate that blood pressure reveals characteristic differences for the several grades of mental defect (8). It is possible that the changes in pulse rate and in respiration, the differential blood count, the osteological development, the proportions of the body-form and all those observed traits which among normals are known to be criteria of age (sometimes expressed as physiological age) (4), may be typically retarded among mental defectives (5, pp. 75-90; 12; 104, pp. 137-155). If so, we should expect such defects to be relatively slight among the higher grades of defectives and decidedly marked among the lower grades. It remains to establish a technic and differential standards before the criterion can be practically available.

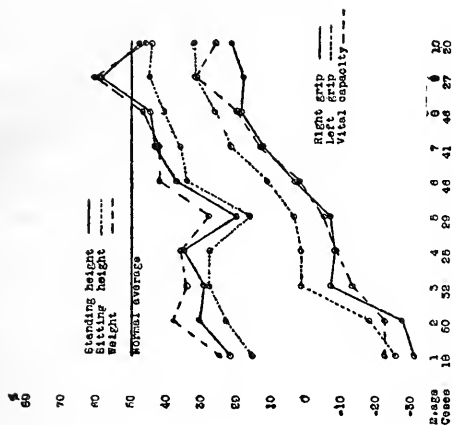


Fig. 2—Curves for boys, showing average percentiles for all measurements in relation to mental age.

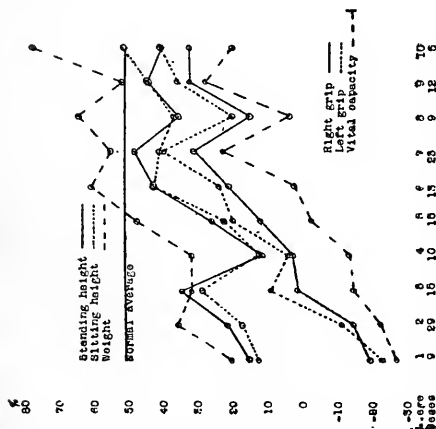


Fig. 1—Curves for girls, showing average percentiles for all measurements in relation to mental age.

Inferior development of mental defectives in gross height and weight and in psycho-physical functioning. Observe the relation between degree of feeble-mindedness (as expressed here by mental age) and degree of subnormality. From Doll's *Anthropometry* (reference 18).

On this hypothesis that feeble-minded persons show a tendency toward more or less complete organic and functional retardation of growth and development, a somatic definition is of profound significance. This embraces the philosophy of the more properly biological aspects of growth, morphological, anthropological, osteological, physiological, biochemical (nutritional), anatomical, and neurological. Somatically, then, feeble-mindedness would represent a tendency toward more or less general arrest of growth and development of the human organism, structurally and functionally, by reason of which the individual affected exhibits a greater or less tendency toward physiological infantility (72, 75).

THE HEREDITARY CRITERION. In approximately two-thirds of the cases investigated, feeble-mindedness has been traced to biological inheritance of defective germ-plasm. In this fact, perhaps, is found the explanation of the uniformity of the coordinate arrest of development of all mental processes, and the tendency toward a lower type of physical organism. Recent studies, notably those of Goddard, seem to prove that this inheritance follows Mendel's Law of unit characters (34). For the hereditary feeble-minded we might therefore establish the criterion of ancestral transmissibility. According to



SOMATIC CHARACTERISTICS OF MENTAL DEFECTIVES

TOP. Group of idiots engaged in serious work pulling a wagon. Observe poor physical tone as expressed in the round shoulders, stooped backs, bent knees, flat feet, inclined heads, shuffling gait, poor carriage, and general inferior physical development. Note also the psychophysical inferiority expressed in the large number needed to pull the wagon, for this is not merely play or "busy work," but productive effort. The metabolism of these "children" requires a differentiated diet, and their low blood pressure makes them susceptible to even slight changes of temperature or altitude. Illustration suggested by Dr. Walter S. Cornell.

BOTTOM. Group of idiots showing physical abnormalities and "stigmata of degeneration." The diagnostic value of these signs is open to question, especially with feeble-minded subjects above idiot grade.

this criterion mental defectives of known feeble-minded ancestry must, upon mating, transmit their defect according to the Mendelian Law. Parents whose feeble-mindedness is not inherited, but is due to "accident," would not be expected to transmit their defect, in accordance with the theory of non-transmission of acquired characteristics. The value of this criterion is impaired by the practical restrictions imposed upon it, since the mating of mental defectives is discountenanced even under natural conditions.

In this causal aspect, feeble-mindedness is a condition due in most cases to defective germ-plasm and in others to various "accidents." For the hereditary cases feeble-mindedness is apparently a recessive unit character transmitted according to Mendel's Law, so that a hereditary feeble-minded person may be defined as one who on mating with another hereditary mental defective will have all defective children; on mating with an untainted normal will have all mentally normal but tainted children; and on mating with a tainted normal will have, on the average, half tainted normal and half feeble-minded children (34, pp. 548 ff.).

CHAPTER III

DIAGNOSTIC METHODS AND VALUES

GENERAL PRINCIPLES. We have shown that the most immediately important criterion is the social, but that since social incompetence is a superficial manifestation of fundamental mental incapacity, and is both vague and variable according to the standards of living in time and in place, we may substitute for it the psychological criterion, which is both definite and constant. But because intelligence itself is closely associated with anthropological development we may propose a somatic criterion. This is entirely fundamental, but is at present too far removed from the more immediate expressions of the condition.

By every definition feeble-mindedness is *arrested mental development*. Therefore the etiology and history of the individual suspected of mental defect must be considered, lest conditions of mental degeneracy, such as, for example, certain of the insanities and some of the epilepsies be confused with it.

Obviously, we ought not to attempt to diagnose feeble-mindedness according to any one of these criteria alone. Many factors obscure the main issues and any one of these criteria represents a complex inter-relation of them all. Nevertheless, some of the criteria are more salient than others, or are more fundamental, or are less affected by accompanying conditions and traits. Therefore, altho we advocate the use of all possible criteria in examining a person suspected of feeble-mindedness, we wish to show that, even if the *weight* of the different factors were not involved, the examination methods and the means of evaluating the data obtained in each field, except the psychological, are so far from satisfactory as to be very nearly useless for scientific diagnosis. Of all the single methods so far advocated for a complete and comprehensive examination only the psychological method or, more accurately, only the intelligence method, has yielded satisfactory results. Our exposition aims to uphold this contention, and will therefore emphasize the psychological method.

At no time need we assume that the feeble-minded are a separate species; the facts already assembled indicate quite clearly that the condition is primarily quantitative retardation on a growth curve, charac-

terized by only minor qualitative deviations from the normal. We understand the condition best, in our present state of knowledge, by assuming that mental growth and development, like physical growth, follow an approximately logarithmic curve, upon which the feeble-minded may be placed at definite stationary points according to the degree of their defect. If we represent this curve as a curve of area rather than as a straight line, it is likely that the feeble-minded represent not merely linear deviation but also surface deviation. The idea would be still clearer if the representation could be made in three dimensions, with the feeble-minded restricted in all dimensions, though unequally.³

At every point in the collection and use of data in the schemas which follow, we need constantly to recognize two aspects which have their respective advantages and disadvantages. These are the objective and the subjective values. By "objective" we mean particularly those data and those interpretations which are demonstrable and verifiable, which are based on measurements and known rela-

³ Limitations of space prevent our developing this argument in detail. We shall content ourselves simply with the categorical statements for which there is satisfactory preliminary proof in experimental and theoretical literature. See, for example, (70, pp. 137-141).

tions, which are sufficiently material so that A is recognized as A constantly, B is equally certain, and C necessarily follows in consequence of the known relation between A and B. These data are material and tangible and may not be questioned, provided they have been obtained under standard conditions. They are highly certain and dependable, untrammelled by conjecture. The "subjective" data, or evaluations of data, are essentially characterized by personal opinion or feeling, perhaps by professional intuition resulting from long practice. They are derived by observation rather than by measurement, and by suspected rather than by demonstrated relationships. For these data there is no certain verification, standards differ, and reliability depends upon authority, experience, or special knowledge. Here the layman gives way to the expert whose unproved word is fiat. The value of these data depends not so much upon the reliably observed facts as upon the art of seeing what others miss, or of apprehending by means of a specially developed apperception-mass. That which is A for one may become B for another, and C follows not as a necessary conclusion but only as a probable inference. Subjective material has its decided values, and objective material its definite limitations. The for-

mer at its best is much to be preferred to the latter at its worst. The competent diagnostician makes use of both with the proper balance that training and experience have directed.

We further differentiate between quantitative and qualitative aspects, that is, between amount and kind, or between the numerical data and the distinctive or characteristic attributes. The former are usually objective and can be put to proof; the latter may be either objective or subjective, usually, though not necessarily, the latter.

Again, we distinguish between the summation and the evaluation of data, that is, between the sum-total of the observed facts and the interpretation of them. The former gives classification or present status, but not necessarily diagnosis. Evaluation, however, weighs the various facts observed, and comes to a conclusion or an interpretation (a diagnosis) by observing that the relationships have a necessary causal connection, or a known concomitance. The subjective and qualitative phases of data may here contradict or even outweigh the objective phases. "Circumstances alter cases," and some data from their very nature cannot give rise to more than plausible inferences, whereas others permit of drawing almost absolute conclusions.

THE DIAGNOSTIC SYLLABUS

To compile a clinical syllabus for individual mental diagnosis is a fascinating task. But many such syllabi are now available (e.g., 43, 44, 49, 105, 107, 111, 118) and we shall resist the temptation to add another. We desire, instead, to bring out certain principles in the evaluation of clinical data and then to lay special emphasis on a representative plan for psychological examination.

The clinical syllabi ordinarily include two major divisions; first, an inquiry into the subject's personal and family history, and, second, an examination of his present status. The second should be obtained independently of the first if it is to be wholly unbiased, but it must be evaluated in the light of the personal history. It is a mistake to allow the knowledge of personal history to direct the course of the examination for present status. The most objective examiner will be somewhat biased, and will tend to emphasize some parts of the examination to the detriment of others, and will find it difficult to maintain an impartial attitude. Nevertheless, in the light of the personal history he may re-examine the subject with the special aim of testing out more carefully the conclusions to which he may have come.

"This ignorance is the indispensable condition of any just examination. It is really too easy to discover signs of backwardness in an individual when one is forewarned" (5, p. 170).

THE PERSONAL HISTORY ordinarily includes four major divisions: (1) family history, including if possible the personal history and status of each member of the direct family line and collaterals for at least three generations; (2) prenatal conditions, fetal and embryonic, including especially nutrition, disease, accidents, hygiene, and total physiological functioning; (3) natal history, the circumstances of birth; and (4) post-natal conditions, the subsequent personal history and development. The post-natal history includes at least nine main divisions, namely: (4a) nutrition, especially in very early infancy; (4b) accident, illness and disease; (4c) organic and structural growth and development; (4d) functional growth and development; (4e) mental growth and development; (4f) environmental circumstances; (4g) attitude and reaction toward society, its members, institutions, and codes; (4h) school history; (4i) industrial history. These are the most significant data. More items might be added, or these items might be sub-classified for detailed investigation. It is unnecessary to give the specific questions

for each line of inquiry; these are already available in various syllabi as mentioned.

THE CLINICAL EXAMINATION as distinguished from the historical investigation endeavors to determine the present status of the person in each of these divisions of the post-natal history. This examination might be carried out in great detail, preferably with each field relegated to its own specialist. The investigation of the individual's ancestry might include similar clinical examinations for members of the family. The ideal clinical examination should include data for each of the criteria of mental defect. But since the criteria are not of equal importance the data for each criterion will be of unequal value in evaluating for a final diagnosis.

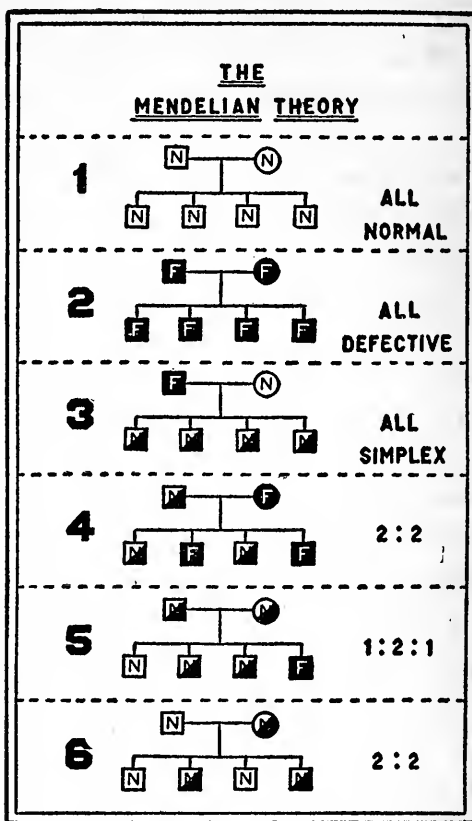
THE FAMILY HISTORY EXAMINATION

METHOD. The investigation of the subject's heredity is conducted as an inquiry by question and answer with such persons as are familiar with members of the family, and by visitation with such family members as are accessible. Data are obtained for as many individuals and as many generations as possible. The testimony of the subject of the examination may also be taken, but with feeble-minded per-

sons even of moron grade it is both meager and unreliable. Family history data must be checked from as many sources as possible. Their value depends upon the degree of reliability established for them. If the evidence is only hearsay it must be properly discounted. Such family members as are seen and interviewed should if possible also be clinically examined, but this is ordinarily impracticable, if not impossible. In the absence of a clinical examination the inquirer falls back upon experience with cases and types, and makes use of "diagnostic conversation." The field worker and the interviewer must be well versed in types and degrees of mentality and in the normal customs and modes of living of various nationalities and of different social classes (14, 16, 34).

VALUE OF FAMILY HISTORY FOR DIAGNOSIS. In view of the latest results of research in heredity these data are most valuable when interpreted according to the Mendelian formulas, considering intelligence as a unit character and normality as dominant (34). According to this hypothesis, persons of normal intelligence and no hereditary taint are duplex, those of normal intelligence with hereditary taint are simplex, and those of subnormal intelligence of feeble-minded degree are nulliplex.

In clinical practice it is almost impossible to establish proof of duplexity for either or both parents. It is almost equally difficult to prove simplexity except from accurate knowledge of a fairly large number of children. Nulliplexity is not so difficult, altho the recognition of high grade feeble-mindedness in adults is sufficiently difficult for the clinic, and much more so for the field worker. But, assume that plentiful, accurate, and positive data have been obtained. Then, on Goddard's evidence that Mendel's Law applies to the inheritance of feeble-mindedness, with normality dominant, two duplex parents must have all normal children, and two nulliplex parents must have all feeble-minded children. If one parent is duplex and the other nulliplex, all the children will be simplex. If one parent is simplex and the other nulliplex, then half of the children, by chance expectation, will be simplex and half nulliplex, altho it cannot be predicted which individual children will be simplex and which nulliplex. If both parents are simplex it may be expected that one child in four will be duplex, two simplex, and one nulliplex, that is, three in four normal and one in four feeble-minded; again no prediction can be made for the individual children. If one parent is duplex and the other simplex, then all the children will be nor-



The Mendelian theory applied to feeble-mindedness, on the assumption that hereditary mental defect is simple intellectual inferiority, and that intelligence is a unit character and normality dominant. The diagram shows the six possible types of matings of duplex, simplex, and nulliplex parents (see glossary), and the average expectation in offspring. Observe that feeble-mindedness can be positively diagnosed from matings of Type 2, but not from any other. (From Goddard's *Feeble-Mindedness*, page 549, reference 34.)

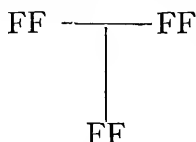
mal, two of them duplex and two simplex. These conclusions are valid only for hereditary parental types of feeble-mindedness, and not for "accidental" types. They also depend upon the validity of the proof that mental defect is inherited according to Mendel's Law, and that enough children result from each mating so that the average expectation is not disappointed. If this law is not valid for these conditions, then the family history loses all positive value for diagnosis until some valid interpretation other than the Mendelian is established.

VALUE OF FAMILY HISTORY FOR ETIOLOGY. Feeble-mindedness, then, in any individual cannot be diagnosed by heredity except when both parents are mental defectives and of the hereditary type. Nevertheless, a study of the family history is both necessary and valuable as serving to *account for* the condition when diagnosed by other methods. For this purpose neuropathic ancestry must also be considered.

It is extremely difficult, however, to establish indubitable proof of the hereditary source of feeble-mindedness in specific cases according to Mendelian formulas, except when both parents are feeble-minded. A close analysis of the degree of probability attainable is most illuminating. According

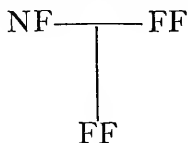
to the Mendelian theory an hereditary case of feeble-mindedness can result from any one of three types of parental matings (see diagram, page 46), namely, Type 2, Type 4, or Type 5; all other matings produce only duplex or simplex children, who cannot be distinguished from one another by external characteristics but only by their subsequent offspring.

TYPE 2, the first type of mating, which can produce feeble-mindedness, is as follows:⁴



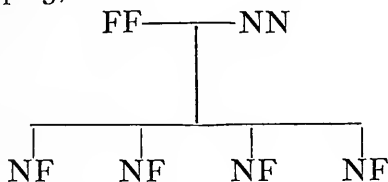
the hereditary nature of the feeble-mindedness of the given child is immediately obvious upon proof that both parents are feeble-minded.

TYPE 4, the second type of mating which might produce feeble-mindedness, is as follows:

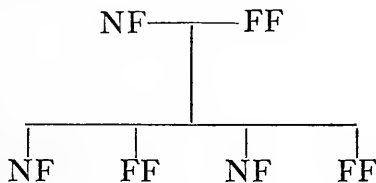


⁴ In the diagrams used to illustrate these types of matings, FF represents hereditary feeble-minded; NF represents simplex normal, that is, a person of normal intelligence but with hereditary taint of feeble-mindedness; and NN represents duplex normal, that is, a person of normal intelligence and without hereditary taint of feeble-mindedness.

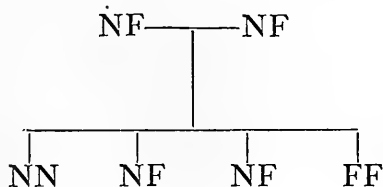
To prove inherited mental defect for the given feeble-minded child resulting from this mating it is necessary to prove that one parent is feeble-minded and the other simplex normal. If the normal parent is to be proved simplex it must be shown that he himself is a child from one of four types of mating, namely, Type 3,



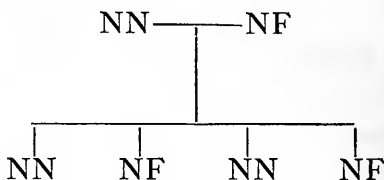
in which case he *must* be simplex, for there is no other possibility; or Type 4,



in which case, also, he *must* be simplex, for by hypothesis he is not nulliplex; or Type 5,



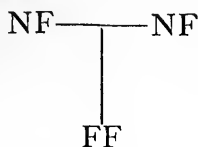
in which case he *might* be simplex or *might* be duplex, with a two to one probability in favor of being simplex; or Type 6,



in which case, also, he *might* be simplex or *might* be duplex, with a one to one probability either way. Therefore, if it is required to prove that feeble-mindedness in a given child is inherited, when one parent is feeble-minded and the other normal, it must be shown that the normal parent is simplex; if this normal parent is the child of mating-types 3 or 4 he *must* be simplex and the given child is probably an hereditary case;⁵ but if the normal parent is the child of mating-types 5 or 6 he *might* be simplex or *might* be duplex, and there is two to one or one to one probability that the given child is an hereditary case.⁵

TYPE 5, the third type of mating which might produce feeble-mindedness, is as follows:

⁵ Altho he might be a simplex child, which is possible in an NF — FF or NF — NF mating, who developed "accidental" feeble-mindedness



The proof of inherited defect for this child is exactly similar to that for the preceding type of mating, Type 4, except that here *both* parents instead of one are normal and *both* must be proved simplex as above.

To resume; if it is required to prove that feeble-mindedness in a given child is hereditary and not accidental, it is necessary to prove that both parents are feeble-minded, or that one parent is feeble-minded and the other simplex normal, or that both parents are simplex normal. To prove this simplex normality of a parent beyond question it must be shown that the parents of each such normal parent are either NN — FF or NF — FF, for if they are either NF — NF or NN — NF only a two to one or one to one probability of simplicity is established. The argument is rather difficult to follow in the abstract, but merits close study at the hands of all who make use of family history in the study of feeble-mindedness. The argument is applied specifically in the family history of our Case 2 (page 100 ff).

Of course it is possible that a feeble-minded child may have inherited his defect even tho one cannot prove the inheritance beyond question, as in matings of Types 5 and 6, for simplicity may be transmitted for an indefinite number of generations without feeble-minded offspring being evident. It is equally possible that feeble-mindedness might be accidental and not hereditary in an offspring of either NF — FF or NF — NF matings. For absolute clinical proof, therefore, of the hereditary transmission of feeble-mindedness only FF — FF parentage is conclusive evidence.

THE SOCIAL STATUS AND SOCIAL HISTORY EXAMINATION

METHOD. There are but few standard social tests of clinical value. Social standards vary with time, place, nationality, and race. "Managing one's affairs with ordinary prudence" is an ill-defined standard with elastic limits, and "maintaining independent existence" in the station to which one is born is still more vague. These standards would serve to indicate idiots and low-grade imbeciles, but not the high-grade imbeciles and morons who do maintain themselves under certain favorable conditions.



SOCIAL DIAGNOSIS BY HOUSES

Typical habitations of feeble-minded families. Would that we might present views of the interiors! One must not, however, confuse the living habits of different races and nationalities with those of mental defectives.

LEFT. Hut in the Pines of New Jersey inhabited by American whites. The woman in the doorway is a high-grade imbecile, and the little girl is one of her potentially feeble-minded children.

RIGHT. Mountain home of "Old John" and his family in the hills of the Delaware Water Gap. John is a high-grade imbecile and his wife is a middle-grade moron, both American whites. The known children of the family are all defective, and each daughter has a record of immorality. The little girl in the foreground is one of John's illegitimate grandchildren.

But there is hope for the development of definite tests of social capacity. Field work has showed that the standards of living of mental defectives fall far below those of the normal members of the same community and race. Defectives also commit asocial and antisocial acts which distinguish them from their normal neighbors (13, 26, 37, 57, 58, 59, 62, 97). But these standards require definite foundation. Some laboratory tests of social capacity are being evolved in the form of tests for vocational guidance and for the industrial and social capacities (27, 83, 114, 115). Most of the current tests for vocational guidance or for social capacity are more or less wholly psychological or pedagogical. For practical judgments of social success we must for the present rely on evidence of ability to conform to accepted social and family conventions, on demonstrated industrial efficiency, and, in children, on school success.⁶

VALUE OF THE SOCIAL DATA. Before a person can be diagnosed as feeble-minded by social tests, it must

⁶J. Harold Williams has recently put forth a tentative "Scale for Grading Home Conditions," and has promised a "Scale for Grading Neighborhoods" (*Journal of Delinquency*, 1916, 1, pp. 273-286). These scales furnish a scientific basis for the measurement of social status, and when perfected will afford an exact means of correlating standards of living with standards of intelligence.

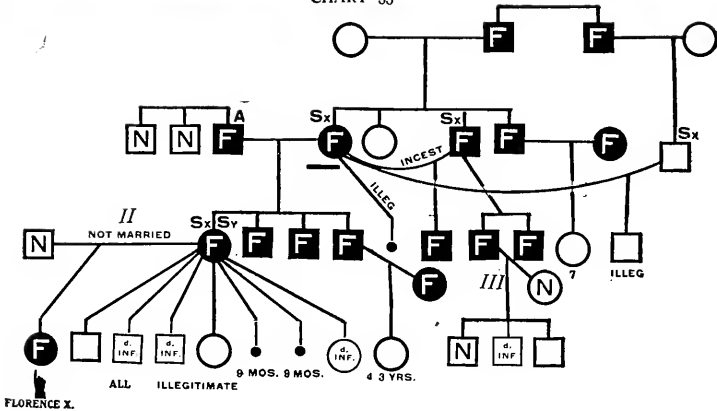
be shown that the social incompetence is due to mental incapacity and not to other factors, for example, physical infirmity, lack of training, lack of opportunity, personality, race, language, laziness, or mental incapacity other than feeble-mindedness. The direct value of the social examination for the diagnosis of feeble-mindedness is therefore very small. Too many mentally normal people are socially incompetent, and too many feeble-minded "get along" in society for the social test to be directly and positively valuable. But because social incompetence is an expression of mental defect it should be taken into account as a check on the psychological data rather than for its own intrinsic value.

THE MEDICAL EXAMINATION

METHOD. There are many syllabi and record forms of medical examination, but very few of them are definitely valuable for mental diagnosis. In fact, there seems no good reason why the medical examination, as ordinarily conducted, should be directly valuable for mental diagnosis. "Medical" in this connection is variously used to cover anthropometrical, anatomical, physiological, and neurological examinations. Ordinarily the first two predominate.



CHART 55



SOCIAL HABITS OF MENTAL DEFECTIVES

TOP. Feeble-minded children at home. The imbecile grandfather (man at right) is now in charge of the family because his moron daughter left her moron husband and her potentially feeble-minded children, and "ran off" to the City. When she returns her husband is going to make her sign papers before the squire to "bind her over to good conduct."

BOTTOM. Family chart showing the promiscuous sex relations of mental defectives. From Goddard's *Feeble-mindedness* (reference 34).

It is neither our purpose nor our function to outline the plan and scope of the medical examination, but rather to discuss its value for the diagnosis of feeble-mindedness. The data to be obtained and the methods and apparatus used are described in many places (e.g., 11). The symptomatology of inactivity, lesion, or disease of the ductless glands is also well defined (e.g. 82a), altho for practical utility and wide application the field of hemadenologic diagnosis is both too recently developed and too highly specialized to be of service as a clinical method except for a very small number of specialists. It is assumed that a purely medical examination does not include such data as are properly psychological, that is, questions regarding orientation in time and place, range of information, and general intelligence.

VALUE OF THE MEDICAL EXAMINATION. It appears to us that the medical examination has been stressed far beyond its real value as an aid in the diagnosis of mental defect. It has never been shown specifically and for individuals how any but gross and obvious physical stigmata, anatomical peculiarities, physiological anomalies, or abnormal neurological functioning are causally related to mental defect, so that a diagnosis could be based upon them. Medical science has yet to prove that mental defect is a dis-

ease or is always due to a lesion of any part of the central nervous system (see page 29).

The medical examination does serve for the diagnosis of the clinical varieties or pathological types of mental defectives (for example, microcephalics, macrocephalics, Mongolians, cretinoids, paralytics, ataxics). But many of these are immediately obvious to the initiated layman upon inspection, and they constitute but a small percentage of all mental defectives. Much the greater value of the medical examination lies in its service as a necessary check upon, and as an aid to, the other examinations. Broadly speaking, the data of the other parts of the clinical examination, psychological, pedagogical, hereditary, and social, cannot be safely evaluated unless the condition of the physical organism is known. It is for this reason that the medical examination is necessary, and not because the medical data are of direct value in diagnosing the mental condition. The medical data may also be especially valuable in some cases by accounting for the condition established rather than by establishing proof of the condition itself. By far the most valuable medical data are those which show a causal connection between mental defect and ductless gland insufficiency. A medical diagnosis on this basis is of

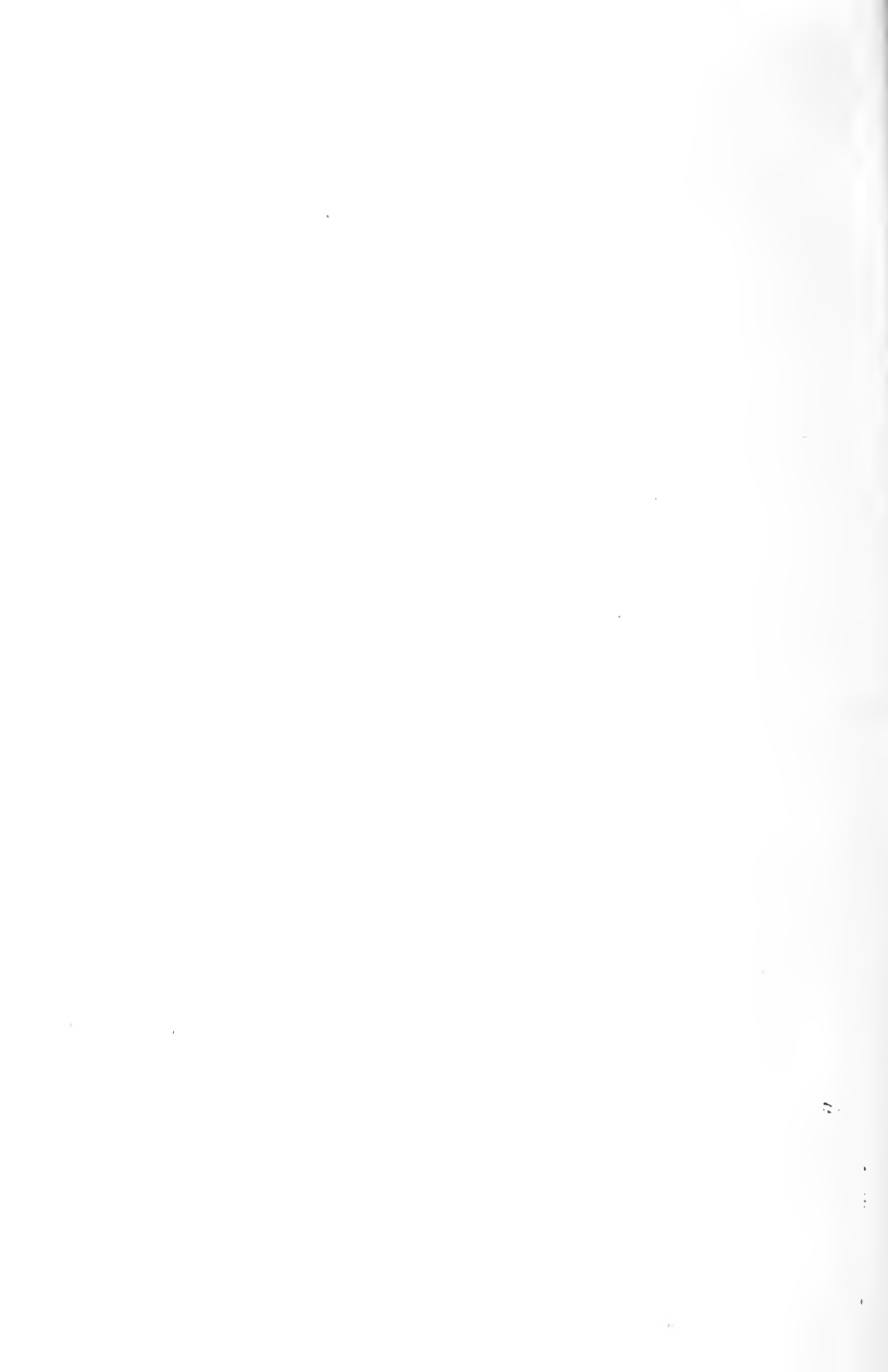


CLINICAL TYPES OF FEEBLE-MINDEDNESS

TOP. Ataxic high-grade imbecile, fifteen years old, mentally seven years. Case 77 in Goddard's *Feeble-mindedness* (reference 34).

LOWER LEFT. Paralytic idiot, thirty years old, mentally two years. Case 226 in Goddard's *Feeble-mindedness*.

LOWER RIGHT. Insane moron, thirty years old, mentally eight years. Case 204 in Goddard's *Feeble-mindedness*. He is a pyromaniac, seems to personify fire and sometimes feeds the furnace fires with a part of his own dinner.



prime importance as the most hopeful present means of prognosis and treatment.

On the other hand, the evaluation of the mental data on the basis of the medical data is wholly conjectural, except for a few specific conditions. If defective hearing or vision is found, and the presence of adenoids pointed out, and the malfunctioning of certain glands made clear, and physiological status determined, and presence or absence of specific diseases established, there is unfortunately no quantitative or objective means of allowing for the effect of these misfortunes in evaluating the other tests. We do not even know that they do affect the development of native mental capacity, altho their effect on accomplishment is known to some extent. Even an expert, qualified both medically and psychologically, can only guess at the allowance to be made. The evidence of institution and clinical experience seems to indicate comparatively slight effect of these conditions upon mental development, except of course in extreme cases.

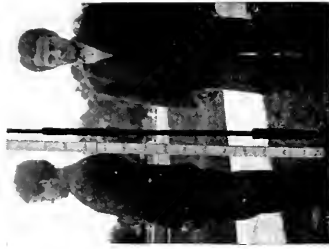
We positively disclaim any intimation that a physician or medical specialist is not qualified to diagnose feeble-mindedness. Except for a small minority of cases our whole contention is that such a person cannot do so by the medical data directly.

If the medical expert is qualified to supplement his medical data with tests of mental capacity, he may diagnose as well as another. The argument is that the medical data by themselves furnish no *direct* proof of mental incapacity amounting to feeble-mindedness (cf. 5, pp. 75-90).

Mitchell (68, pp. 90-92) states: "For the physician the problem of feeble-mindedness is often regarded as purely a medical one and a knowledge of the structure and function of the entire organism is the requisite for a diagnosis.

"We have shown that the notion of feeble-mindedness is one of social fitness. The feeble-minded is the one who will never have the ability to maintain himself without assistance. The weight of evidence goes to show that most feeble-minded children are offspring of similarly incapable people. It is not that the individual has degenerated, but rather that in the particular line there are serious limitations in the way of development. There is not a pathological condition from which the victims may be relieved by some treatment. All people are subject to similar limitations. The only difference between the normal and the feeble-minded is that in the case of the latter the limitations are an insuperable barrier to the maintenance of an independent existence.

"With the acceptance of this notion there is eliminated any serious contention that the medical practitioner is the only qualified diagnostician of mental status. We would not be considered as going on record that no medical practitioner is qualified to give a diagnosis of feeble-mindedness. Our position is that by virtue of his training in the medical school alone he is not able to diagnose with a greater degree of accuracy than is the layman. Although several medical schools are considering the project, there is none in the country to-day where, as an undergraduate, one is given instruction which enables him to give an accurate diagnosis of feeble-mindedness. The physician who has not had a train-



CLINICAL TYPES OF FEEBLE-MINDEDNESS

LEFT. Epileptic idiot, sixteen years old, mentally one year. Case 158 in Goddard's *Feeble-mindedness* (reference 34).
CENTER. Macrocephalic moron, twenty-four years old, mentally ten years. Case 278 in Goddard's *Feeble-mindedness*. Macrocephaly is found occasionally in persons of normal intelligence, and in all grades of feeble-mindedness. The condition is caused by hydrocephaly or gliosis.

RIGHT. Microcephalic idiot, sixteen years old, mentally one year. Case 234 in Goddard's *Feeble-mindedness*. Microcephaly is rarely, if ever, seen in persons of normal intelligence. The condition is caused by early closure of the cranial sutures in the absence of the internal pressure caused by normal brain development. In rare instances hydrocephaly is associated with microcephaly (see illustration opposite page 30).

Page 10

The first part of the document
discusses the importance of
maintaining accurate records
and the role of the
auditor in this process.

The second part of the document
describes the various methods
used to collect and analyze
data, including interviews,
surveys, and focus groups.

The final part of the document
concludes with a summary of
the findings and a list of
recommendations for
improving the system.

ing supplementary to the standard course in the medical school is in the same relation to the problem of feeble-mindedness that the student with the regular arts course in the college is to the problems of the medical sciences."

Binet and Simon speak of "the medical method, which aims to appreciate the anatomical, physiological, and pathological signs of inferior intelligence," and add that "the medical method is indirect because it conjectures the mental from the physical" (5, p. 40). They conclude that, "the medical method . . . is applicable only in a restricted number of cases, and . . . reveals *possible* signs of defect" (5, p. 90).

THE SOMATIC EXAMINATION

METHOD. A complete somatic examination is seldom used for the diagnosis of feeble-mindedness. We discuss it here not as an established method, but as one whose development is highly desirable. It is our belief, according to the somatic criterion, that in all phases of growth and development feeble-minded persons exhibit a tendency toward correlative retardation of the entire organism, structurally and functionally, which is greater or less according to the degree of mental subnormality. We therefore call attention to the possibility of ultimately developing such a method, which, if valid, would be an invaluable part of all examinations for mental status. We further believe that this is the natural and logical course which the medical method should pursue, and we feel that such a method, based wholly

on physical data, might prove positively and objectively valuable for direct diagnosis.

Numerous detailed plans of study have been proposed for the anthropological study of individuals, but not for the purpose here demanded (e.g., 41, 42, 43, 65, 75). At present no single one of these plans is sufficiently comprehensive, and none of them is based on satisfactory norms for individual diagnosis, altho selected details from each plan can be utilized advantageously. The anthropometric features predominate both in scope and in practical value. Many physical traits have been established as more or less closely associated with definite life-ages (4), but nowhere has there been evolved a simple practical scale which combines and practically utilizes all these scattered facts.

A theoretical plan of investigation for establishing a complete somatic scale is relatively simple in principles, but highly complex in detailed procedures. The final solution of this problem involves many serious difficulties which will require many years of study before they can be surmounted. But the total result of such research would be of inestimable scientific and practical value. One needs first to discover which physical traits are dependable criteria of age. This would in part be determined by the degree of



CLINICAL TYPES OF FEEBLE-MINDEDNESS

LEFT. Cretin idiot, five years old, mentally about two years. The photograph was taken after she had received thyroid treatment for a period of four months and shows very marked mental and physical development over her original appearance and abilities. Illustration, courtesy Mr. Alexander Johnson.

RIGHT. Mongolian imbecile, twenty-one years old, mentally four years. Case 252 in Goddard's *Feeble-mindedness* (reference 34). This type of mental defect appears sporadically in good families, and, according to the more recent theories, seems not to be of hereditary origin but due to abnormal functioning of the glands of internal secretion in the mother during gestation.

1875

correlation between traits and by the reliability and mean variability of the quantitative norms. The most significant traits could then be combined into an age-scale, with units of known value. Finally the value of this scale should be established for diagnosing intelligence as well as age. With such a scale, of known reliability and correlations, one could easily measure the degree of somatic development of any person and reason from it to his intellectual status. Not until the medical method is firmly established on some such basis of norms and differential variation will it be of more than inferential value for mental diagnosis (cf. 5, pp. 75-90).

THE PEDAGOGICAL EXAMINATION

METHOD. No one has yet developed a valid systematic method for the determination of individual pedagogical status which might be used for mental diagnosis. The idea of such a method is not new (5, pp. 70-75; 106), but the realization of it is still awaited. The past few years have witnessed an unprecedented interest in pedagogical standards and measurements, and many valuable results have been developed. The work of Thorndike, Courtis, Ayres, Starch, Ballard, Ballou and many others marks a new era in scientific pedagogy, notwithstanding that

it has been adversely criticized with respect to methods, criteria, results and conclusions, not only from the point of view of science and logic, but especially of pedagogy in the strict sense (53, 54, 101).

VALUE OF THE PEDAGOGICAL METHOD. From the standpoint of individual mental diagnosis all this work is nearly valueless except within wide range limits. The experiments have been conducted on groups instead of with individuals, and the results have been treated by central tendencies without reference to individual variability. The study of individual differences has been one aim of some of these studies, but none of the results shows how to determine individual status. Thus, to cite a single example, Starch established norms of hand-writing by school grades (92), but found that in individual instances one could not tell from an individual performance whether the child reacting to the test was in the first or in the fifth grade, because variability was so high. Moreover, the conditions under which pedagogical test-results are obtained are exceedingly difficult to control, and most results so far presented fail to take adequate account of these variable conditions. Before the pedagogical method can be established on a solid basis for mental diagnosis the scholastic tests must be applied to individual

cases under known conditions, and the individual variations from the norms obtained must be known. Unless this variability is sufficiently small so that the performances of different age groups are reasonably differentiated, the tests cannot be used for individual diagnosis. Here again it appears that by arranging a number of tests on an age-scale basis a valuable method might ultimately be developed. In order that the results of the pedagogical examination may be applicable to the diagnosis of feeble-mindedness it needs further to be proved that the lack of pedagogical accomplishment is due to mental disability and not to other factors, such as dislike for school, physical unfitness, nationality, absence of opportunity, truancy, and the like.

But success in school, granting normal conditions, is one severe test of mental capacity, and failure to profit from scholastic instruction is therefore one of the significant suspicions and evidences of underlying mental defect (113). Few feeble-minded children of even the highest types ever do more than fifth-grade school work successfully, although under exceptional circumstances a few mental defectives reach even high school. These exceptions rarely belong in the high school grade in which they are found; such children have only a superficial under-

standing of the work they are doing. The school departments at institutions for the feeble-minded seldom have more than the first four grades of the ordinary public school. Speaking broadly, a primary school child who is more than three years behind the grade in which he belongs for his age, assuming normal opportunity, or who has repeated a grade more than twice, may properly be suspected of being mentally defective (5, p. 71). Mental tests of such cases in public school systems seldom indicate a normal mentality.

The pedagogical examination is best suited to children of school age, altho it is applicable to adults who have had school advantages. Unwillingness to attend school may be in itself a sign of mental incapacity.⁷ Inability to learn, especially in the academic school branches, is one of the surest marks of mental defectiveness, and most cases of feeble-mindedness exhibit the earliest signs of their defect in this way. The majority of potentially feeble-minded children (23) who have come under our

⁷ A study of the mental capacities of truant children by Miss Elisabeth A. Irwin ("Truancy, a Study of the Mental, Physical and Social Factors of the Problem of Non-attendance at School," published by the Public Education Association of the City of New York, June, 1915, pp. 66) showed that 43 per cent of 150 children absent from school in New York City without legitimate excuse were feeble-minded.

attention have been brought to us for this reason.

The pedagogical status is especially necessary and valuable as the most definite objective expression of mental capacity, and the pedagogical data and school history are therefore only second in importance to the psychological data, especially with children, for whom school data are comparable with the social data of adults. Industrial ability may be taken as an expression of pedagogical status (see page 78).

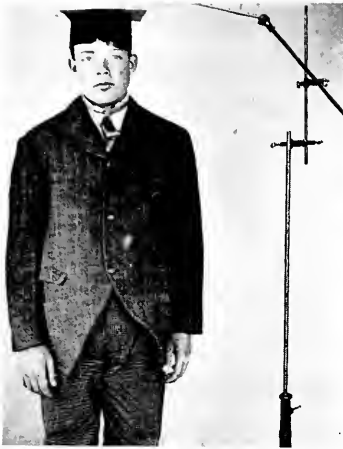
Binet and Simon have evaluated the pedagogical method very clearly. They speak of "the pedagogical method, which aims to judge of the intelligence according to the sum of acquired knowledge" (5, p. 40), and "which is very frequently applicable, and which reveals *probable* signs of defect" (5, p. 90). The reader should not fail to read Binet and Simon's exposition of the relative values of the medical, pedagogical, and psychological examinations. In describing the pedagogical examination they distinguish between scholastic and extra-scholastic knowledge and give a rough measuring scale for both. One of their later contributions (5, pp. 253-9) should also be read in this connection. Here they make a clear distinction between intelligence and scholastic ability, and say, "It seems to us that the scholastic aptitude admits of other things than intelligence; to succeed in his studies, one must have qualities which depend especially on attention, will, and character; for example a certain docility, a regularity of habits, and especially continuity of effort" (5, p. 254).

THE PSYCHOLOGICAL EXAMINATION

IMPORTANCE. Since the fundamental and ultimate judgment of feeble-mindedness rests on the psycho-

logical criterion, it is natural that the psychological examination should play the most important part in the diagnosis of mental defect. This is a logical consequence of the inherent nature of mental defect. But it is only within the last decade that the psychological nature of feeble-mindedness has received much attention. Binet and Simon, in 1904, began systematic studies of backward children in France, and in 1906 Goddard began his researches in feeble-mindedness at The Training School at Vineland. At that time it was not generally understood that feeble-mindedness is primarily a state of subnormal intelligence, and the psychological methods of measuring intelligence were then in their early infancy, consisting for the most part of isolated mental tests borrowed from the laboratories of experimental psychology, and already fallen into disrepute.

As a first result of their early studies Binet and Simon concluded: "It seems to us that in intelligence there is a fundamental faculty, the alteration or the lack of which is of the utmost importance for practical life. This faculty is judgment, otherwise called good sense, practical sense, initiative, the faculty of adapting one's self to circumstances. To judge well, to comprehend well, to reason well, these are the essential activities of intelligence. A person

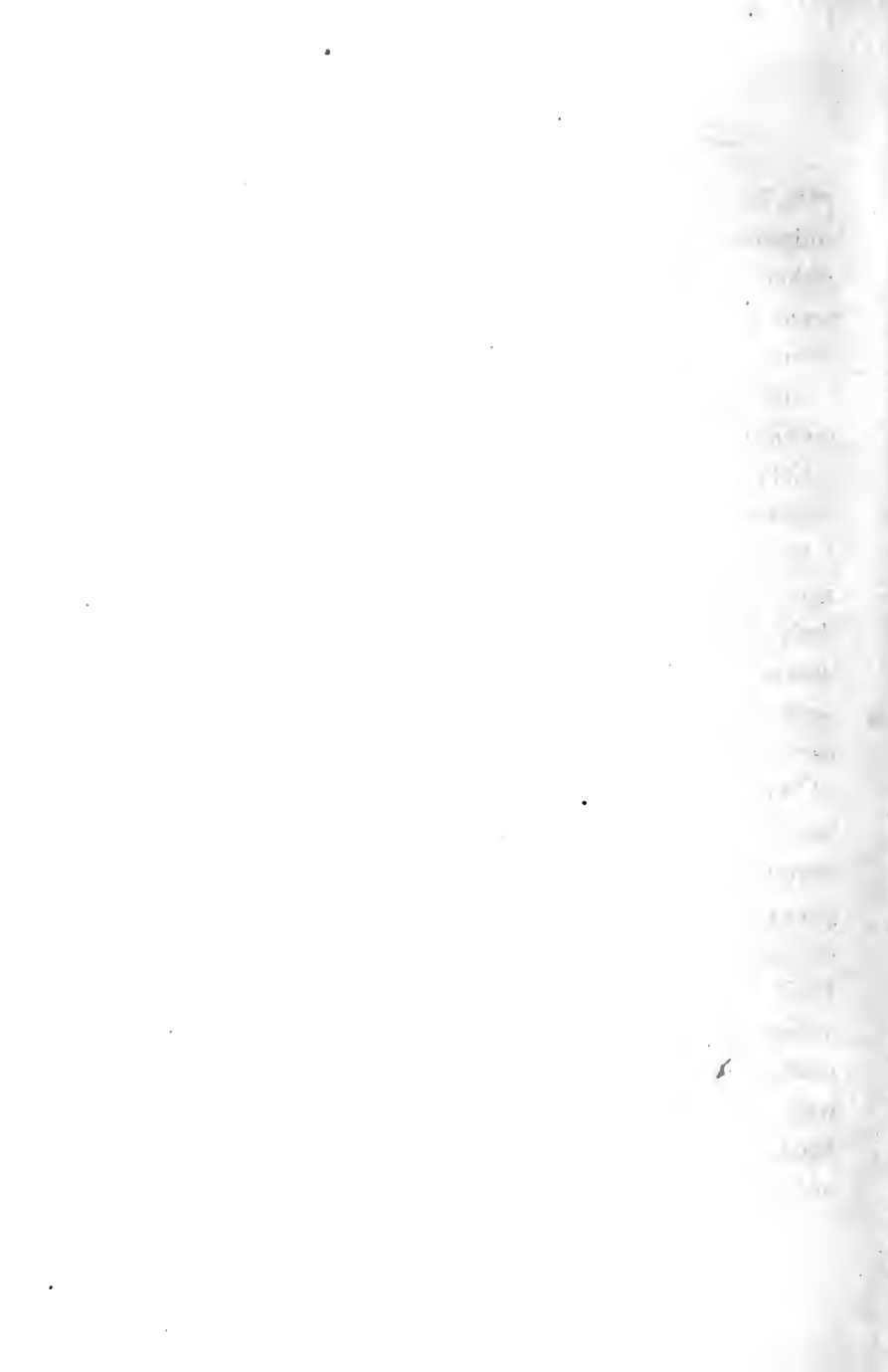


TYPES OF TESTS FORMERLY USED IN DIAGNOSING FEEBLE-MINDEDNESS

These tests failed to meet the demands of practicability, for they measured mental ability only indirectly and individual variations in performance proved excessive. For illustrations of the more recently developed tests consult case studies, pages 80-192.

LEFT. Ataxiagraph, or Romberg test, designed to measure equilibrium. Experimental results indicate, in general, that normal subjects sway forward and back (eyes closed) and feeble-minded subjects sway sideways. The test is frequently used in cases of nervous disorder.

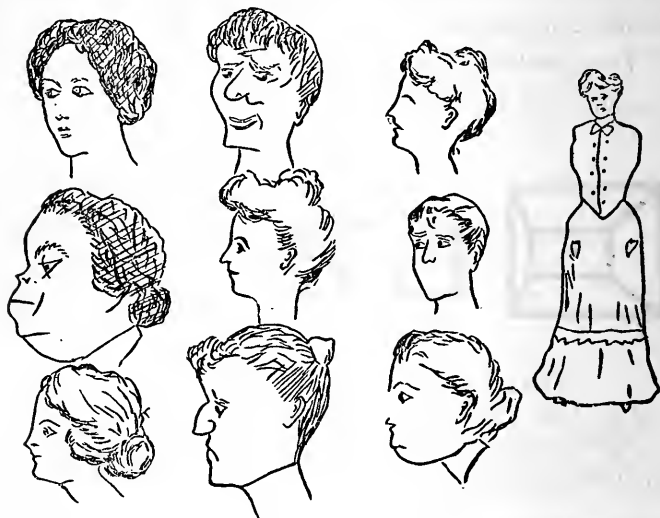
RIGHT. Stereognosis, recognition, or failure to recognize (astereognosis), by the sense of touch alone. Mental defectives are rather strikingly inferior in this ability. The test is of some service with the lower grades of mental defect but not with morons.



may be a moron or an imbecile if he is lacking in judgment; but with good judgment he can never be either. Indeed the rest of the intellectual faculties seem of little importance in comparison with judgment" (5, p. 42).

METHODS. Binet and Simon sought adequate methods of measuring intelligence, and finding no satisfactory means at hand, they set about the construction of a new method, and ultimately derived a scale of tests for measuring general intelligence by age levels. The history of the development of their Measuring Scale for Intelligence need not detain us here. An ample literature describes the Scale's advantages, scope, and proper use (e.g., 20, 60, 67, 95, 99). The practical value of the Scale is due to the fact that the tests proved highly practical, that they established differential age norms, that they measured, on the whole, native capacity, and that they correlated with the practical ratings according to the so-called "tests of life" (20). Moreover, not only were differentiated age-norms established for normal children, but the method was tested with feeble-minded subjects as well, and clear differences and diagnostic criteria fixed. The value of the method for the diagnosis of mental defect lay not so much in the determina-

tion of normal standards alone, but especially in proving how mental defectives could be differentiated by it. That this point is overlooked in most



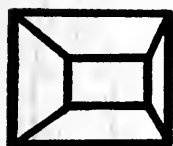
Mental tests from the Binet-Simon Scale (see illustration, page 88). Left. A normal child of six years is able to judge which face in each horizontal pair, shown separately, is prettier. Right. A normal child of seven years is able to name the parts of the body which are missing in each of these pictures.

For brief detailed description of these and other Binet-Simon tests see reference 33.

mental test standardization is evident from published results. The significance as well as the fact of inferiority or of superiority in the reaction to a mental test must be proved before the result can be

used for mental diagnosis. Retardation by the Binet-Simon Scale would mean little in itself for mental diagnosis were it not known that a certain degree of retardation means ultimate arrest and consequent feeble-mindedness.

This method takes first place in the psychological examination for feeble-mindedness. It serves only



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MENTAL TESTS FROM THE BINET-SIMON SCALE

Left. A child of ten years can reproduce this design from memory after he has seen it exposed once for ten seconds.

Right. A child of eleven years can arrange these groups of words into meaningful sentences.

as a preliminary examination with doubtful or borderline subjects, but may prove all-sufficient in cases of outspoken defect. It is expected that the examiner who makes use of the Scale is adequately trained in its use and in psychology. The literature of mental tests furnishes many valuable isolated tests and groups of tests, in addition to the Binet-Simon Scale, but few of them are satisfactory for the diagnosis of feeble-mindedness. Of those that may be satisfac-

tory in content, purpose, and procedure, the majority either are not standardized at all or else the standardizations do not meet the requirements of differentiating tests for subnormal subjects. They especially lack positive criteria for the differentiation of mental defectives, either as a class or by grades. Typical of the few exceptions to this indictment are the Kent-Rosanoff association test, Pintner's standardization of the Knox cube test, the Smedley group of anthropometric tests, the De Sanctis tests, the Porteus motor-intelligence tests. Many other tests have been either partially or unsatisfactorily standardized. In general the objections to the use of these standards are: too few cases, statistical limitations (overlapping of group variability), chronological age limitations, absence of feeble-minded norms. Some tests, valid for normal children, are invalidated with defectives because of the influence of chronological age and greater experience. Some other tests have been adequately standardized, but are not practicable; perhaps they require complicated apparatus or too much time for administration. Still other tests are much too difficult for mental defectives, tho they serve well for differentiating higher levels of normality. Many mental tests are valueless because they measure inconsequent characteristics.

The foregoing discussion applies, of course, to tests that can be applied objectively, either quantitatively or qualitatively. There is no end to the number of tests that one might use or devise for subjective psychological analysis. One needs but a little ingenuity and insight to make a test of almost anything involving a reaction to a stimulus. Our constant plea is for such mental tests as can be used in the open light of the court room or to the satisfaction of parents, rather than behind the clinic's closed doors. Expert clinical diagnosis which need not be objectively verified is another matter.

There is no limit to the tests available, but there is a definite limit to those which are helpful for diagnosing mental defect. In looking over the field of tests, the writer, without attempting to exhaust the possibilities, had no difficulty in tabulating eight pages of different mental tests (not including physical tests or the more purely experimental psychological measurements). This included 30 groups of tests used or devised by as many different authors, and 25 authors of single tests or groups of less than three.⁸

⁸ There is neither space nor need to list all of these tests here. The authors include such names as Abelson, Bonser, Burt, Cattell, Claperede, Ebbinghaus, Fernald, Franz, Gilbert, Goddard, Hancock, Healy, Heilbronner, Jastrow, Johnson, Knox, Masselon,

It is not our purpose to outline the specific procedures of the psychological examination, but rather to evaluate the data therefrom and to point out limitations. The psychological method is far from satisfactory or complete. As developed thus far it takes account only of the intelligence level and not of the other manifestations of mind, for example, temperament and character. Few satisfactory diagnostic methods or tests have been differentially standardized for learning capacity, specific mental processes (aptitudes), motor coordinations, affective states, or will, altho many clinicians employ various empirical tests of these qualities and evaluate them subjectively. The Binet-Simon Scale avowedly measures essentially judgment or thinking, the capacity for adaptation (5, p. 38). It takes account of other mental qualities only indirectly. In so far as these other qualities develop coordinately with the intelligence, the level of intelligence represents the level of the other mental traits. It seems highly probable that this coordination exists, but the assumption needs experimental demonstration. Vice versa, on the same assumption, one might estimate the level of

Norsworthy, Oehrn, Pierson, Porteus, Rossolimo, Squires, Scott, Sommers, Stern, Terman, Trabue, Whipple, Whitley, Woodworth and Wells, Wyatt, Ziehen, and many others.

the intelligence by determining the level of development of these traits, if a satisfactory method could be established. The current controversies in this whole field augur well for the future development of mental tests, and will undoubtedly result in one or more methods much more desirable than any now in use.

In using any mental tests and systems the examiner must be guided by the particular type of subject under examination. The reactions to one test are clues to the next to be employed. This guiding principle must be observed; *every test measures both general ability and specific ability*, or the whole consciousness as well as specific mental processes, and the degree of each is dependent upon the use or adaptation of the individual test, and also upon the subject's reaction to it (52, p. 21; 90). Furthermore, it is exceedingly difficult, except from the subject's introspection, to say what specific ability a test measures; the same test may measure different mental processes for the same individual at different times, or for different individuals at the same time. The reason for this is obvious; consciousness is unitary, and every mental reaction includes not a single "faculty" but a complex interaction of many of the elements of consciousness (1, p. 310). Under

modifications of conditions the same test may be so adapted as to measure *predominantly* some one or more of these elements. This point has been overlooked by many mental examiners; while admitting in theory the unity of consciousness, in practice they belie this admission. They thus fail to recognize that such a test as the historic "A-test" measures now perception, now apperception, now the various states of attention, now memory, now association, now the processes of learning, and above all a general adaptability to the conditions of the test as a whole. Thus, Abelson concludes that all of his various tests, in spite of their psychological variety, measure essentially "clear awareness" (1, p. 301). The writer was forced to the same conclusion from a practice experiment with an imbecile girl; fourteen tests of supposedly clear-cut qualities were employed, but each test measured merely fluctuations in attention.⁹

⁹ Compare, for example, the complex of factors which are involved in the form board test as analyzed by Herman H. Young in his "Physical and Mental Factors Involved in the Formboard Test," *Psychological Clinic*, November 15, 1916, Vol. X, No. 6, pp. 149-167.

The recent work of McCall is particularly illuminating in this same connection and deserves careful study. See "Correlation of Some Psychological and Educational Measurements, with Special Attention to the Measurement of Mental Ability," by William

Because of this difficulty it is hazardous to group tests for the measurement of definite mental functions (81, 91, 114, 117); moreover, allowance must be made in each test for general intelligence. Spearman (89, p. 231) gives a formula for making this allowance, but its application is rather involved and difficult, especially for individual cases. Just as in imagery the method of reproduction is not necessarily the same as the method of stimulation (an auditory stimulus being reproduced from visual imagery by apperceptive translation), so it is not certain that the evident mental process involved in a mental test is the only one which is really elicited. Introspection should make this clear. But it is almost impossible to obtain reliable introspection with untrained children or abnormal subjects. Behavior psychology may eventually overcome this difficulty.

VALUE OF THE PSYCHOLOGICAL EXAMINATION.

To resume, feeble-mindedness is essentially mental incapacity, and can be directly determined by the psychological examination. At present this method is best represented by tests for intelligence levels. Of these the Binet-Simon Scale, in any of its modifica-

Anderson McCall, *School and Society*, January 6, 1917, Vol. V, No. 106, pp. 24-30. A more technical report is published under the same title in *Contributions to Education*, No. 79, Teachers College, New York, 1916, pp. 87.

tions (e.g. 5, 33, 49, 98, 117), is by far the most practicable and reliable instrument. Few others are standardized for differential diagnosis of mental defectives. Additional psychological methods, including perhaps the measurement of temperament, character, and aptitudes, should prove valuable and will ultimately be devised, but are not now available for practical purposes. The results obtained by the Binet-Simon method should first be checked for validity by careful ascertainment of presence or absence of invalidating factors, such as physical conditions, negativism, simulation, fatigue, and the like. The Binet-Simon method is essentially objective and quantitative, but psychologically trained examiners can make pertinent use of qualitative data and subjective impressions. Acquaintance with many types of cases strengthens the evaluation of the data. By the Binet-Simon method feeble-mindedness is almost always (probably more than 95 times in a hundred) an accurately safe diagnosis when the person examined exhibits a mental age under 12 years with an absolute retardation of more than three years (7, p. 41; 40, p. 236), or a relative retardation of more than 25 per cent. The grade of mental defect is determined by the mental age (36, 79), which seldom increases after absolute retardation exceeds

four or five years, or when the intelligence quotient (I. Q., the ratio of mental age to life age), falls below 50 (22; 23; 64; 95, pp. 70 ff.; 98, pp. 65 ff.).

No absolute method has been attained for objectively evaluating conflicting results of different mental tests. No specific method has been developed for making allowance for physical or environmental disadvantages in evaluating the psychological data. So far as the mental tests measure native ability it seems highly probable that only extreme physical misfortunes or gross environmental insufficiencies have any appreciable influence in causing poor performances in mental tests. Neither has any one attempted to say how one shall evaluate the results of the several parts of the clinical examination if they conflict, altho Kelley (55) has developed a hopeful method. This is a serious lack in present diagnostic methods, which should be overcome as soon as possible. It is the custom to weigh the psychological data most heavily, or in reality to attempt to establish the reliability of the psychological data by using the other data, medical, social, ancestral, and pedagogical, as checks upon the mental capacity. In actual practice these data are evaluated subjectively, and the conclusions differ according to the experience or the bias of the individual diagnostician.

To illustrate the use of the various examination methods and materials and the proper selection of tests suitable to the circumstances accompanying the individual subject, several illustrative cases are presented in detail in Part II of this book. The cases are purposely chosen to represent different types, and to bring into display the varying values and interpretations of the various clinical data. These cases are not typical of the average "run" of mental defectives, with the exception of Case 1. They represent those rarer types which present unusually difficult diagnostic features.

INDUSTRIAL CLASSIFICATION OF MENTAL DEFECTIVES IN RELATION TO MENTAL AGE AND TYPE (GODDARD)

Mental Age	Industrial Abilities	Type	
Under 1 yr.	(a) Helpless (b) Can walk (c) With voluntary regard	Low	Idiot
1 yr.	Feeds self. Eats everything.	Middle	
2 yrs.	Eats discriminatingly.	High	
3 yrs.	No work. Plays a little.	Low	Imbecile
4 yrs.	Tries to help.		
5 yrs.	Only simplest tasks.	Middle	
6 yrs.	Tasks of short duration. Washes dishes.	High	
7 yrs.	Little errands in the house. Dusts.		
8 yrs.	Errands. Light work. Makes beds.	Low	Moron
9 yrs.	Heavier work. Scrubs. Mends. Lays bricks. Cares for bath-room.		
10 yrs.	Good institution helpers. Routine work.		
11 yrs.	Fairly complicated work with only occasional oversight.	Middle	
12 yrs.	Uses machinery. Can care for animals. No supervision. Cannot plan.	High	

PART II
ILLUSTRATIVE CASES

THE END

Faint, illegible text, possibly bleed-through from the reverse side of the page. The text is arranged in several paragraphs and is difficult to decipher due to low contrast and blurring.

CASE I

DONALD N. OBVIOUSLY FEEBLE-MINDED BY BINET-SIMON EXAMINATION

Binet-Simon examination. Donald, born 4/14/95, was first examined 3/5/10, at the age of 14.9. By Goddard's 1910 revision of the B-S Scale (38) his mental age was 9.6 years. He passed all the tests at years VI and VII, failed memories at VIII and at IX, passed months and money at X, and absurdities at XI. (When recounted by Goddard's 1911 revision (33), this record gives a mental age of 9.4.) Absolute retardation amounted to 5.3 years, relative retardation 36 per cent. (I. Q. 64), and gave rise to a diagnosis of feeble-mindedness, and a classification of middle-grade moron.

Altho in this case the Binet-Simon examination by itself yielded a reasonably safe diagnosis, it was supplemented by other data. Let us see how much positive help these data give.

Mental tests. Ataxiagraph, automatograph, muscular memory (45), tapping, maze, and cancellation tests (110) failed to give clear-cut objective results.

A suspicion of mental defect was shown by each test, but this was curtailed by the range of normal variation and the lack of definite standards.

Anthropometric measurements, at the age of 16.4 (the first available after the mental age was determined), showed standing height 1765 mm., sitting height 900 mm., weight 63.0 kg., right grip 44.0 kg., left grip 46.5 kg., and vital capacity 3200 cc. By comparison with the Smedley tables these measurements yielded percentiles, respectively, of 92, 74, 83, 60, 85, and 43, with a slope of 83/63 for the general trend of the anthropometric curve (18). The slope and the specific characteristics of this curve were those of typical feeble-minded cases of high grade, but because the percentiles were all above 50 the curve had to be considered normal. Interpreting these measurements somewhat differently, standing height was average for 19 years, sitting height for 17, weight for 18, right grip for 17, left grip for 18, and vital capacity for 16. He was, therefore, average in physical measurements for boys two years above his age, and in psycho-physical measurements was average for boys one year above his age.

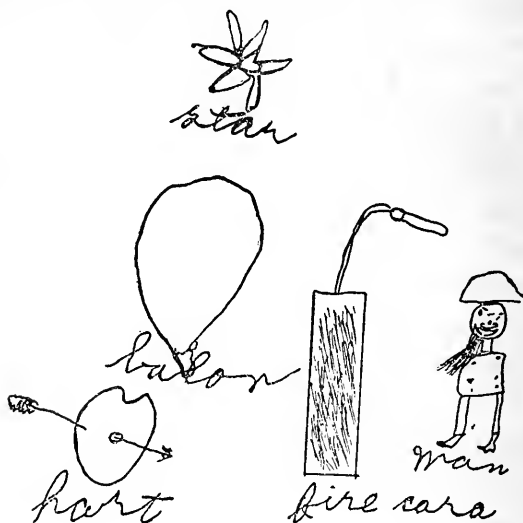
Speeds in the *form-board test* (35) were 18, 18, and 20 seconds, respectively, for three successive trials. According to Goddard's standards the best

speed was average for the mental age of 9 years.

Appearance. This boy exhibits no outward signs of his defect. He is a handsome physical specimen, well-built and well-proportioned, no significant stigmata, pleasant and intelligent face, alert manner, good gait, not awkward. Only extended and well directed conversation makes one conscious of his mental deficiency; then, a poverty of ideas, a lack of originality, limited information, and vague comprehension of abstract relations are apparent. But these are subjective impressions of which most visitors who interview him seldom become aware. They stand out more definitely and clearly under observation in standard situations.

Medical examination. A medical examination at the age of 12.5 showed cranial measurements normal, physique normal, von Pirquet positive, Wassermann negative, urinalysis negative, all other data normal except for "sinking of ribs over apex of heart" and "depression of sternum." The value of these data lay in the fact that they did not invalidate the mental tests by showing physical bases. This examination alone was of no value to the physician in diagnosing the case unless there were added to it his impressions of the subject's mental reactions and abilities.

Pedagogical data. A formal pedagogical examination was not made, but school reports are now available. These show that he attended an orphan



Original drawings

7—, Donald (in school) March 1909
(age 13.9 years)

Original drawings by Donald N. at the age of 13.9 years, representing a star, a balloon, a heart, a fire-cracker, and a man.

asylum school for two years, but made no appreciable progress. Furthermore, in spite of the exceptional educational advantages offered by the school department of The Training School, with its inten-

sive and extensive individual teaching, he has never been reported as being able to do better than poor first-grade academic work. In music, and in manual and industrial work he came to be one of the ablest of all the pupils. In particular he did well as a farm hand and learned to handle machinery, and to work with comparatively little supervision. He played well on the bass horn, both band and solo work, and altho he was somewhat careless he had the reputation of being, under supervision, "the finest industrial worker" at the School.

Personal and family history. No personal or ancestral data could be obtained. The boy was a ward of the State Board of Children's Guardians. An attempt was made to study his family history, but diligent search discovered only that he had previously been taken into a Catholic children's Home in a small city of northern New Jersey. No trace of the family could be found.

Social history and personal characteristics. During adolescence Donald was a disciplinary problem of the milder type. As a young man, at the end of adolescence, he now is nearly a model of good behavior. But he is still a boy, and could not be expected to "manage his affairs with ordinary prudence," altho he could easily earn a good living be-

cause of his industrial ability, due to the careful and extensive training which he received while young.

Following is a letter which he wrote to Santa Claus, at the age of 19.6:

Nov 26-19-14

My Dear Santa

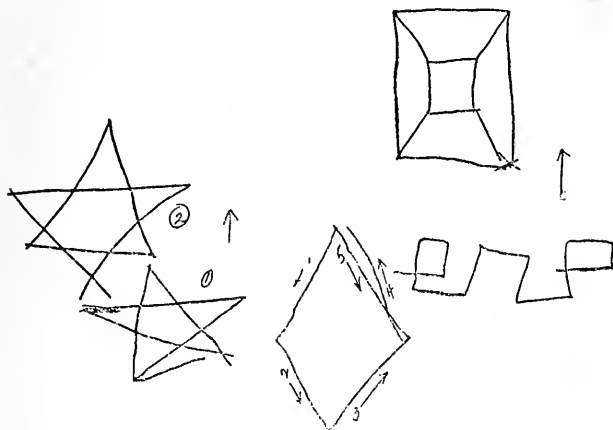
I wish you would please send me these things a pair russet button shoes size 8 and either a blue or reed norfolk sweater and about a dozen gellet safte razer blades I well be glade to get these things yours truly Donald N to frend Santa Cluas

He is easily led, which, in spite of his pleasant disposition, would make him a social menace if at large in the world. Recently he was induced by a brighter boy companion to run away. They easily "got jobs" on the outskirts of a large city, but in a week, for trivial reasons, they quit and were by chance apprehended. The history of this trip is indeed a verification of the diagnosis of mental defect. Some time afterward it seemed that Donald was planning a second runaway, but he was easily prevented by an officer's surreptitious removal of his Ingersoll watch. It is significant that until a brighter boy stimulated his imagination he was always willing to be treated as a big boy at the School where he was under supervision.

Retests. Donald was examined by the writer

5/27/15, using Goddard's 1911 revision of the Binet-Simon Scale. The result showed a mental age of 9.6, which was identical with the first and four succeeding examinations by several different examiners. In these repeated tests he showed some losses and some compensating gains over the earlier tests, but the gross results have always been identical. He passed all tests up to year IX. At IX he failed to make change, saying that 3 cents from 20 gives 16, 7 from 25 gives 17, and 6 from 20 gives 18, with the actual money before him. As an independent member of society he would be dependent upon the honesty of merchants or the kindly financial assistance of friends. At year X he exhibited only hazy knowledge of the pieces of money above one dollar (altho he had had ample opportunity to know money values), failed in the abstract comprehension tests, and in constructing a sentence. At year XI he succeeded with the rhymes, but missed all the other tests of that year. At XII he passed only the suggestion test, and that in such a fashion as to merit discount on the basis of previous experience and memory. His failures in these tests could not be said to be due to lack of scholastic or other training, for he had been pressed to learn all that his mental ability enabled him to assimilate.

Conclusion. Thus all experience and observation with Donald confirm the diagnosis made in 1910. At the end of five years of intensive training in all



Donald's reproductions from copy; the Binet-Simon diamond and design, and the superposed triangles.

fields of learning his mental capacity is the same as at the first examination.

This case is typical of the milder forms of high-grade defect frequently met with in institution experience. The cases which follow are much more individual, and comparatively rare.

CASE 2

GEORGE G. POTENTIALLY FEEBLE-MINDED

Binet-Simon examinations. This boy, born 6/18/03, was examined by Dr. H. H. Goddard, in February, 1911, at the age of 7.7 years. By the 1910 revision of the Binet-Simon Scale (38) his mental age was 7.2, which by the 1911 revision (33) became 7.0. He was not able to copy the square or the diamond, but passed all other tests at years V, VI, and VII, and at VIII succeeded in the verbal comparisons and the days of the week; he missed all the higher tests. The revised results showed an absolute retardation of .7 years, relative retardation 9 per cent (I. Q. 91), and gave rise to a classification of "at age," with diagnosis suspended. Because the retardation was so slight George was not considered feeble-minded. But he showed many subjective symptoms of subnormality and certain physical anomalies. He could not, therefore, be considered normal, and a diagnosis as to potential mentality could not be made (23).

He was re-examined by the same examiner ten

months later, age 8.5. This time he managed to draw a very poor, tho acceptable square, could repeat 5 digits, and showed adequate knowledge of the pieces of money; in other respects the examination was as before. He had gained .6 years and the mental age was 7.6; absolute retardation .9 years, I. Q. 89, classification either "at age" or backward. A year later by the same examiner, the mental age was 7.8, retardation 1.7 years, I. Q. 82, classification backward. By this time the examiner's subjective impressions induced him to venture a tentative diagnosis of potential defect, and the boy was admitted to The Training School three months later. The writer examined him at that time and found a mental age of 8.0. "Scattering" characterized the objective record and the tests missed were characteristic failures of the feeble-minded (23, pp. 57f).¹⁰ These data with the subjective data of reaction-attitude, quality of response, eccentricity, and fatigue, led again to a tentative diagnosis of mental defect, with the added suspicion of superimposed neuroses.

¹⁰ The "scattering" of mental defectives in Binet-Simon tests, anticipated in (23), has been experimentally demonstrated and the diagnostic value made clear in an article not yet printed but presented in abstract in the *Psychological Bulletin*, Feb. 15, 1917, Vol. 14, No. 2, p. 75, "'Scattering' in the Binet-Simon Tests," a digest of a paper presented at the twenty-fifth meeting of the American Psychological Association, New York, 1916.

A month later, by the same examiner and under practically identical examination conditions, the boy tested 9.0, a year's increase in a month, which gave a return to the first I. Q. of 91. This was interpreted to be the most favorable reaction the subject could give, an inference which later experience substantiated. His previous tests had each contained a number of border-line credits on different individual tests, and at this sitting he managed to get plus credits on all these. The examiner felt that the preceding tentative diagnosis was considerably strengthened rather than weakened, and that the sudden increase in mental age was due to temporary fluctuations so often found in psychopathic subjects and did not represent real mental development. Three months later a relatively inexperienced examiner tested him and found a mental age of 8.6, and two months after this another relatively inexperienced examiner found a mental age of 7.8; the I. Q. was then 76. The writer again examined him at the age of 10.9, and obtained a result of 8.2, I. Q. 75, and six months later the mental age was 8.0, I. Q. 70, retardation 3.4 years. It seemed that the tentative diagnosis was probably correct. In May, 1915, age 11.9, a different examiner established a mental age of 8.4, and in November, 1915,

another examiner obtained a rating of 7.6, I. Q. 61, retardation 4.8 years. The tentative diagnosis of potential feeble-mindedness could now be changed to a reasonably safe diagnosis of feeble-mindedness of the high-grade imbecile or low-grade moron type, with psychopathic tendencies.

Experience with such cases gave rise to the following description, based upon the objective data and the subjective impressions gained during the Binet-Simon examinations: "The boy is feeble-minded, of high-grade imbecile or low-grade moron type. The mental age is variable between the levels of 7 and 9 years. It will probably remain slightly variable at this level, probably never exceeding 9 nor falling below 7. The basal year has never exceeded VI. The boy should receive thorough physical, physiological, and psychiatric examinations. He appears anemic and in poor health, with a tendency to early physical and mental fatigue. There appears to be a mental instability which may have either a physiological or neurological basis. By psychological 'faculties' memory is fair, observation keen, attention mobile with voluntary control for only short periods, imagination active and fertile, abstract comprehension and reasoning almost totally lacking, adaptation fair, motor coordination and control poor, general

intelligence subnormal, specific abilities somewhat unequally developed, general mental control fluctuating and variable." This much and more might be concluded from careful observation of the quality and quantity of the reactions under the standard situations of the Binet-Simon examinations. Let us see how this is confirmed or contradicted by other data.

Mental tests. The first Binet-Simon examination was supplemented by the form-board test (35) and by the Smedley group of physical and psycho-physical measurements (18). *The form-board* first trial was performed in 24" and a second trial in 30", without errors. The subjective quality in the reactions, as observed, was normal, and the speed and errors on the first trial were average for 7-year children. The second trial showed a loss in speed instead of a gain, presumably a sign of fatigue. *The anthropometric measurements* yielded these data: standing height 1196 mm., sitting height 658 mm., weight 21.0 kg., right grip 10.0 kg., left grip 10.0 kg., vital capacity 700 cc. By the Smedley tables these measures gave percentiles, respectively, of 56, 50, 26, 20, 20, and 0. The slope of the anthropometric curve was 44/13, and the specific nature of the curve was that of a typical feeble-minded subject of low moron grade.

ANTHROPOMETRIC MEASUREMENTS

Name G., George Born 6/18/03
 Date 11/3/14 Time 11:20 Mental Age 8.0
 Examiner E. A. Drexel Observers _____

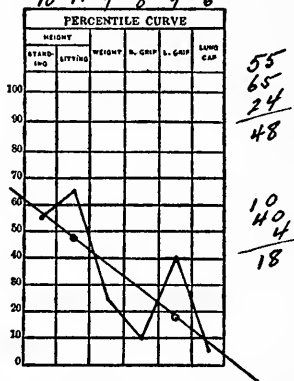
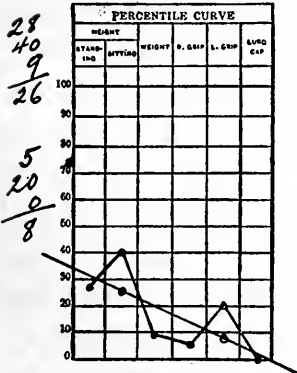
Standing height 1338 R. Grip 13.0
 Sitting height 728 L. Grip 15.0
 Weight 27.2 Vit. Cap. 1100

Sex M

Age 11.4

$$S = \frac{26}{8}$$

Av. for age 10 $S = \frac{48}{18}$



Smedley anthropometric measurements and curve for George G. The individual points of the curve as well as the downward slope are typical of high-grade imbeciles. The figures at the left of the graphs represent the comparison percentiles derived from the original measurements. The curve at the right is drawn for the age at which George's physical measurements are most nearly average; the figures at the top of this graph give the age for which each individual measurement is average. For detailed description of the method see reference 18.

These same tests have been continued at other Binet-Simon examinations and have shown, in general, this same relation to the mental age results. The form-board performances have been markedly variable, ranging in speed from 13 to 30 seconds, and in errors from 0 to 2. The anthropometric curve has always been typically defective; altho there has been definite increase in physical and psychophysical measurements, it has not been commensurate with the increase in age, with the result that the curves have become increasingly defective in type.

Appearance. At the time of first examination George seemed to be of normal size, but anemic and thin. The head was relatively large, with prominent ears, thin cheeks, deep sunken and piercing eyes. General appearance suggested poor physical condition with a suspicion of tuberculosis. He was sharp and alert, tho in a decidedly nervous fashion. Physical, physiological, and neurological examinations seemed highly desirable.

Medical examination. The resident physician's report at the time of his admission was as follows: "Flat feet. Anterior-posterior spinal curvature, large outstanding ears. Nasal septum. Wears glasses to correct defective accommodation in left eye. Lungs not well developed. Nutrition poor.

No heart lesion. Knee-jerk exaggerated on left side. Superficial veins prominent. No diseased organs."

A neurological and psychiatric examination was made by the research psychopathologist, but at the present writing these data are not available. So far as the writer remembers, these examinations showed no positive defects altho there were suspicions of "constitutional inferiority."

Pedagogical data. A hasty examination showed that George had no scholastic ability, and the application blanks stated that he had been to public school for a year without results. He was considered a trainable case, but in general his school training yielded very meager results. He was uninterested and careless in his work. His defective motor coordinations kept him from any high degree of accomplishment in manual work, his physique prohibited industrial work, and his low mental capacity rendered him unable to learn academic subjects. Because of the low mental ability, poor physique, and neurotic disposition he was finally scheduled for out-of-door errands, in which he still does well, and finds perfect happiness.

Personal history. The writer interviewed the boy's mother, who has always cooperated in seeking his best interests. No significant data on family or

personal history could be obtained. The admission blanks showed that he walked and talked late (at 2 and 3 years respectively), that he had always been physically delicate and subject to disease, that severe constipation was evident during three years of early infancy, that at times he exhibited uncontrollable temper and crying, and that he had attended school for one year without results. No hereditary basis could be found to account for the condition, nor were the natal and the post-natal medical histories anything but ordinary.

Social history and personal characteristics. No special data on personal history are available, other than the mother's reports, which were negative in significance. The boy has always been docile and gentle. He is childish in interests and associations, tho he seems on the whole to shun companionship, and appears satisfied with his own company. Some incidents of his life, which we do not feel at liberty to disclose, point toward the possibility of a Freudian "mother complex."

Conclusion. This case is typical of those which need observation and re-examination over a period of years before a positive diagnosis can be made. It is interesting to observe, however, that whereas no officer who was associated with him was prepared

to consider him feeble-minded until very recently, the Binet-Simon examination from the first gave objective suspicions of potential defect (in the low basal year and detailed character and distribution of responses), and was the most important factor in both the initial and final diagnoses.

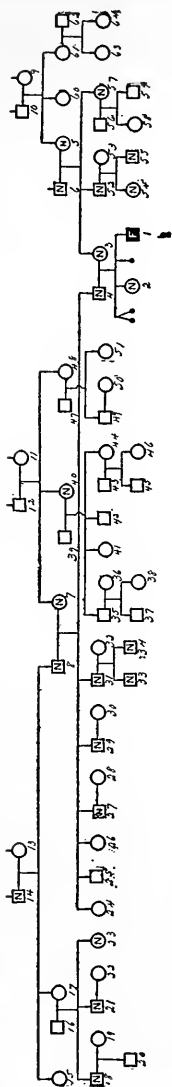
Subsequent history. Since the above was written George has been re-examined three times for mental age, twice with Goddard's 1911 revision (33) and once with the Stanford Extension and Revision (98). On 8/2/16 a relatively inexperienced examiner, using Goddard's revision, established a mental age of 8.0 retardation 5.2 years, I. Q. 61. On 11/6/16 a research assistant found a mental age of 8.6, retardation 4.8 years, I. Q. 64. On 11/14/16 another research assistant, using the Stanford Revision, found a mental age of 8.5, basal year VI, retardation 4.9, I. Q. 65. These results substantiate the earlier results that the boy is feeble-minded and that he has attained his full mental development, which functions variably between 7 and 9 years.

A form-board test (108) given 11/6/16 showed successive speeds of 20" with 1 error, 22" with 1 error, 15" with 1 error, and 17" with no error. It will be recalled that his previous records in this test ranged in speed from 13" to 30" and in errors from

0 to 2. The best speeds are average for mental age above 11, and are much better than might have been expected from his actual mental level.

Anthropometric measurements (18), 11/6/16, indicated that he was one year retarded in physical measurements and six years retarded in psychophysical measurements. The Smedley percentiles for the measurements were, successively, 14, 23, 18, 5, — 1, 5, which gave a slope of 18/0, which is characteristic of middle-grade imbeciles.

Family history. Since this case report was concluded the family history has been more carefully investigated by Miss Mary Hoover. At this writing Miss Hoover has been able to see only Mrs. G., but was able to secure from her quite a fund of information. As we have stated, Mrs. G. has personally studied the problem of George's defect, and was therefore prepared to give a rather full account of his heredity (see chart, page 101). It hardly concerns us to present an elaborate account of all the family members. We shall emphasize only the essential facts. All the members of the family are described as "normal" by Mrs. G., but on our chart of the family only those are labeled "N" for whom she gave some direct information which could be considered evidence of normality. Other family



Family chart of George G. All family members except George are said to be normal, but only those have been labeled "N" for whom there was cited direct evidence of normality (see pages 100-106).
 Legend: Circles represent females and squares males. Vertical lines indicate lineal descent, and horizontal lines marriages and offspring. "N" signifies normal intelligence; "F" signifies feeble-mindedness; absence of marking signifies mentality undetermined, but presumably normal; small black circles signify miscarriage. The individual members are numbered for convenience of description.

members are left "undetermined," but may nevertheless be provisionally considered as normal (see footnote, page 159). The family members are described below in numerical order according to the chart numbers on page 101.

1. George, our Case 2, is the younger of two children. Our clinical study has proved him feeble-minded. To the personal history data in our report it may be added that his birth was "difficult"; that "his spine was too long and had been shortened"; that the family doctor pronounced him tuberculous, a condition which later was considered "disposed of"; that he "bordered on St. Vitus' Dance." Mrs. G. knew of nothing unusual in the period preceding George's birth. At birth the baby's head was peculiarly shaped. There may have been special circumstances of birth of which Mrs. G. was not aware, for apparently the attending physician considered the delivery rather unusual. (This physician has not yet been visited.) Neither was there anything striking in George's early post-natal life, except that he walked and talked late, at two and three years, respectively. He has had measles, whooping cough, scarlet fever, and the suspected tuberculosis and chorea.

2. Janet, older sister, a bright, active girl now in

high school.

3. Mrs. G., née Y., mother of George, a refined, sensitive woman, a school teacher before her marriage, who has done some advanced collegiate study. The home surroundings reflect her culture and domestic efficiency. Two miscarriages preceded George's birth, which Mrs. G. is unable to account for, except that in the case of the twins it might have been induced by over-exertion or by ocean bathing. To the physician these miscarriages might indicate possible luetic or neurotic taint, a possibility not investigated by the field worker. Mrs. G.'s parents and siblings are normal. Her younger brother, number 52 on the chart, is in the publishing business and has two children, 54, 55, in high school. Her younger sister, 57, was formerly principal of a city school and has two children, 58, aged ten, and 59, aged six years. Mrs. G.'s father, 6, Mr. Y., died at the age of eighty-one from "old folk's gangrene" following "a stroke of paralysis which affected his foot." He had a distant cousin who is a huckster and is considered "rather queer," but who is too far removed from the direct family line to be of significance here. Mrs. G.'s mother, 5, died at seventy-one of "heart trouble." She had two sisters, 60, 61, both of whom "died of myxedema"; the children of

one of these sisters, 61, are also dead, cause not stated. Apparently there is mild constitutional defect in the Y. family.

4. John B. G., father of George, holds a position at a moderate salary in an office. He was not seen by the investigator. His parents and siblings are normal, so far as could be learned. He is the oldest of four living children; three younger siblings, 24, 25, 26, died from scarlet fever. His nearest brother, 31, works for a well-known life insurance company, and has two children, 33, 34, in high school. The next younger brother, 29, is a grocer, married but childless. Another brother, 27, is a line-man for the local street railway, and is thot to be the least promising of these children; he was married only recently. Mr. G.'s father, 8, managed a coal and ice business, and employed about twenty-five men. He died suddenly of "heart trouble." His oldest sister, 15, is unmarried. His next older sister, 17, has three children, two of whom, 18, 21, are physicians, and the other, 23, is a girl active socially. Mr. John B. G.'s mother, 7, who is now an elderly woman, competently manages her deceased husband's business affairs. Her younger sister, 40, is active in church work; she had four children; the oldest of these, 35, has a son, 37, aged seventeen,

and a daughter, 38, somewhat younger; 41, the second child of 40, died of peritonitis, and 42, the third child, was accidentally shot; 44, the youngest daughter of 40, has two children, 45, 46. The youngest sister of Mr. G.'s mother, 48, lives on a farm; she has two children, 49, 51. Mr. John B. G.'s grandfather, 14, now dead, managed the coal and ice business which is now managed by his son's wife.

Conclusion. It is obvious that we cannot prove by Mendelian formulas that George's defect has been inherited, for he might have been a normal child, like his sister, and have acquired the condition. But there is no medical developmental history sufficient to account for his mental condition. If, on the other hand, the condition is hereditary his parents must be simplex normals. This is theoretically possible, but is unlikely, for all four grandparents are normal and all siblings are normal. The grand-parental matings, therefore, might be Type 1, or Type 5, or Type 6 (see page 46). If they are Type 1, Mr. and Mrs. G. must be duplex and George cannot be considered an hereditary case by the Mendelian Law. If they are either Type 5 or Type 6 there is, respectively, a one to two or a one to one probability of their being duplex, and again George could not be an hereditary case. But there is still a

two to one or a one to one possibility, assuming grand-parental matings, Type 5, or Type 6, that Mr. and Mrs. G. are simplex, which would result in a possibility, not demonstrable to a reasonable degree of reliability, that George is after all an hereditary case. But even on this last assumption one must prove mental defect in the ancestors preceding the grandparents, *and on both sides of the house*. It seems, therefore, quite unlikely that George has inherited his defect, altho one recalls that all the ancestral evidence has been obtained from one person, who in spite of a desire for honesty, might have been either prejudiced or in error. And finally, in the absence of both medico-etiological history and ancestral evidence we must confess ourselves at present unable to account for George's condition.

CASE 3

WALTER D. POTENTIALLY NORMAL

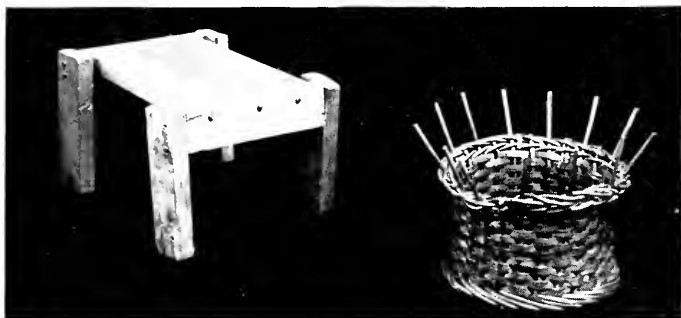
Binet-Simon examinations. This boy was examined 12/2/15 by a research assistant, using Goddard's 1911 revision of the Binet-Simon Scale (33). Walter passed all tests at years IV, V, and VI, missed colors at VII (because of slow speed), missed naming days of the week at VIII, passed making change and arranging weights at IX, and passed absurdities at XI. All other tests above year VIII were missed. This gave a mental level of 8.2 years. The birth date was given as 5/18/07, but may be incorrect; inquiry gave a presumption of correctness. If accepted as correct, his age was 8.6, retardation .4 years, I. Q. 95, classification normal.

Experience has shown that at least some mental defectives develop intellectually at a normal rate up to a final level; thereafter mental development may cease suddenly or very gradually (22, 23). One cannot, therefore, be sure that a boy who tests "at age" is in fact potentially normal, that is, will always test at age. Case 2 has shown how such a child may

ultimately prove to be feeble-minded. Such subjects are undoubtedly the crucial test of diagnostic methods; they tax them much more severely than do the high-grade borderline cases of adult age. The diagnosis is, in effect, a prognosis of the most delicate nature, especially if the case presents obscure symptoms of abnormality.

Walter presented none of the definite characteristics of potential defectives in the preliminary mental tests (23). A detailed study of the Binet-Simon reactions showed that all the specific results were different from those obtained with feeble-minded cases. The tests missed were not the ones which are missed by defectives, whereas those which defectives characteristically miss were passed by him. The basal year was not significantly low, especially when the nature of the failure of the one test at VII was taken into account. The subjective quality of the reactions was suspicious of defectiveness, but not significantly. The reaction-attitude was normal throughout the examination, except that the boy was timid, and lacked the assurance exhibited by most normal children of his age.

This initial test was followed by a re-examination by the writer, 1/17/16, in which the Stanford Extension of the Binet-Simon Scale (98) was used. In



TOP. Walter D., Nov. 14, 1916, at the age of 9.5 years. Note the large head but otherwise normal appearance.

BOTTOM. Stool and sewing basket made by Walter D. in school. The stool was made with no assistance except verbal direction, and the basket with only direction and "starting." It took him from six to eight weeks, 30 minutes a day in class, to make the stool, but he did not put forth his best effort; he did so poorly that he was not allowed to add the top needed to complete the stool. He made the basket in about a week, 45 minutes a day in class, working at his best. Note, however, that woodworking is intrinsically more difficult than basketry from the standpoint of intelligence. It is not surprising that the teacher of woodwork thinks him feeble-minded whereas the teacher of basketry thinks him normal.

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1900

this and in subsequent tests the boy was examined in the presence of five witnesses. In the Stanford Scale he passed all the tests at years III and IV, missed colors at V (not due to speed, but to error), missed repetition of sentence at VI, missed pictures at VII, passed counting 20-0, third degree comprehensions, and similarities at VIII, passed arranging weights and making change at IX, missed all tests at X and at XII, and passed problems of fact at XIV. Other tests above XII were so obviously difficult that they were not given. In addition to the tests mentioned, he passed the alternative tests at III, IV, V, VI, VII, VIII, IX and X years except days of the week, dictation, months, 20-syllable sentences, and Healy puzzle A. No additional credit, however, was allowed for these. By the Stanford Scale, then, the mental age was 7.7 (basal year 4), retardation 1.0 year, I. Q. 89, classification backward. It will be noticed that the change in mental age at this sitting was due wholly to mechanical differences in the Scales used. The reaction-attitude was normal throughout the examination, but was marked by shyness.

Mental tests. The Binet-Simon examinations were supplemented by a variety of tests, for the purpose of substantiating the tentative diagnosis of potential

normality. The selection of tests was limited in range by the subject's age and by his inability to read or write. The tests were administered on Mondays, Wednesdays and Fridays (with only one or two exceptions) at 11 to 12 A. M.

Numerous *anthropometric measurements* were made, especially with regard to the lengths of the parts of the body. According to the comparative tables available in Martin's *Lehrbuch* (65), these measurements were average for boys of 10 years, except that sitting height was average for about 12. He was therefore physically advanced two years, and body proportions were approximately normal for age 10, except that the trunk was unusually long for that age. By the Smedley tables he was average for boys of 10 years in standing height, 12 years in sitting height, 10 years in weight, 10 in right grip, 9 in left grip, and 10 in vital capacity. The anthropometric curve sloped downward, but had to be considered normal in type, for all percentiles were above 50, and the specific relationships of the percentiles were those of normal children; the slope was 94/77. This curve did not correspond to the typical curves established for potential defectives (18).

Cephalometric measurements showed that the length of the head (glabella to maximal occipital

protuberance) was 192 mm., the breadth (greatest transverse diameter) was 144 mm., the height (tragus to vertex) was 130 mm., and the circumference (over supra-orbital, occipital, and supra-auricular points) was 540 mm. According to Bonifay, quoted by Montessori (69), the circumference corresponded to the average for children above 13 years, the longitudinal diameter corresponded to the average for adults, and the transverse diameter corresponded to the average for children of 8 to 10 years. The indexes resulting from these measurements were, length-breadth index of 75 (dolichocephaly), length-height index of 67.8 (chamæcephaly), and breadth-height index of 90.3 (tapeinocephaly). Cranial capacity, according to Manouvrier's modification of Broca's cubic index (69), was 1700, or, according to Schmidt's formula (65), was 1980. The latter bordered on macrocephaly, especially in view of the subject's age. It therefore appeared from these measurements that the shape of the head was not significantly abnormal, but that the size was out of proportion to the other body measurements, and was quite beyond the averages for his age, and bordered on macrocephaly. This indicated possible cerebral pathology (gliosis or hydrocephaly), but at the time could not be definitely interpreted.

The form-board test, procedure according to Whipple (108), gave results as follows: first trial 26.0" and 2 errors, second trial 17.6" and 1 error, third trial 16.2" and 1 error, fourth trial 15.0" and no errors. There was a marked reduction in speed and no signs of fatigue. The best record was average for mental age 11. This test showed no symptoms of defect either by observation or by objective standards.

Vision, roughly measured by *the McCallie vision tests*, literate and illiterate sets (29, 66), was 20/20, with no noticeable difference for either eye. A rough *watch test* showed hearing not seriously defective.

In the *Knox cube test* (76) Walter passed line *a*, missed *x*, passed *y*, *b*, *c*, *d*, and *e*, missed *f*, passed *g*, missed *h*, passed *i*, and missed *j*. The score by this test, 16+ years by Pintner's standards, is remarkable. It is far above the mental age and chronological age expectation. For Walter this test seemed to measure the specific ability of concentrating attention rather than the general level of his intelligence. Such a performance in this test is very exceptional with even the highest-grade defectives. There was no evidence of fatigue, and his interest was sustained. Failures seemed due to momentary lapses of atten-

tion and resulted in renewed effort on his part.

Writing. He could not write Starch's "Mary had a little lamb" (92), or simple words from dictation. He wrote his name legibly. Asked to "write any word" he wrote *red* and *caat*. Asked to write "boy" he wrote first *day*, then *Bad*, and then *Gay*.

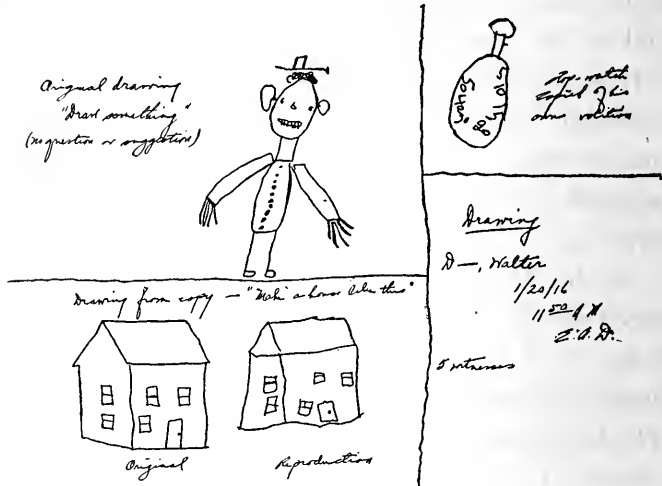
Reading. He knew all the letters of the alphabet, tho some not so well, and could read only a few words of not more than three letters. He failed to read more than two words in *Ballard's test for reading* (2) and could not read grade I of *Cornell's graded reading test* (10).

Arithmetic. He passed the first grade tests in addition, subtraction, multiplication and division, in *Cornell's graded arithmetic test* (10a), passed two of the second grade addition tests, but missed all others.

Drawing. Asked to "draw something" he drew, without receiving any suggestion, a representation of a man which was creditable for a child of about 7 years. During a pause in the testing he also, of his own accord, made a picture of the stop-watch which lay on the table. When asked to copy a simple conventional house he reproduced the original with fidelity of detail and proportion.

In *Whipple's mirror-drawing test* (109) he per-

sisted for nine minutes in spite of the (for him) great difficulty of the task. In response to a question from the examiner, he was willing to "give up" at the end of the time mentioned. He had traversed



Original drawings of Walter D. The man is typical of the drawings of normal children of about seven or eight years, and is considerably better than those made by most mental defectives under nine or ten years' mental age. Compare with the man drawn by Donald N., page 84, which is not nearly so complete in body details.

three sides of the star, with many errors and breaks, altho he followed the lines closely. The persistence shown in this test was the most significant result.

In the *Woodworth and Wells substitution test* (112) the speed per line, from first to last, was (in

seconds), 48, 44, 38, 32, 33, 35, 34, 33, 34, 27, total time 358 seconds. He made no errors. The speed was retarded by his inability to write the figures with ease. Part of the reduction in speed per line was due to his obviously greater ease in writing toward the end of the test. After the sixth line he made no reference to the key. While no standards are available for this test with young children, it appeared that his performance was at least good for normals of his age, and showed no sign of defectiveness.

In the *Healy controlled tapping test* (47) the speed per line was (in seconds) 5, 5, 6, 6, 6, 4, 11, 7, 6, 6, 6, 6, 6, 6, 6, 6, total time 92.6 seconds. Two taps instead of one were made in seven of the squares. The long time for line 7 is not accounted for in the record. In a *free tapping test (after Abelson)* (1) he made 131 taps in 30 seconds, an average of 4 per second. Deducting, at this rate, the time of uncontrolled tapping for the Healy 150 squares, the time for control was 54 seconds for 150 squares.

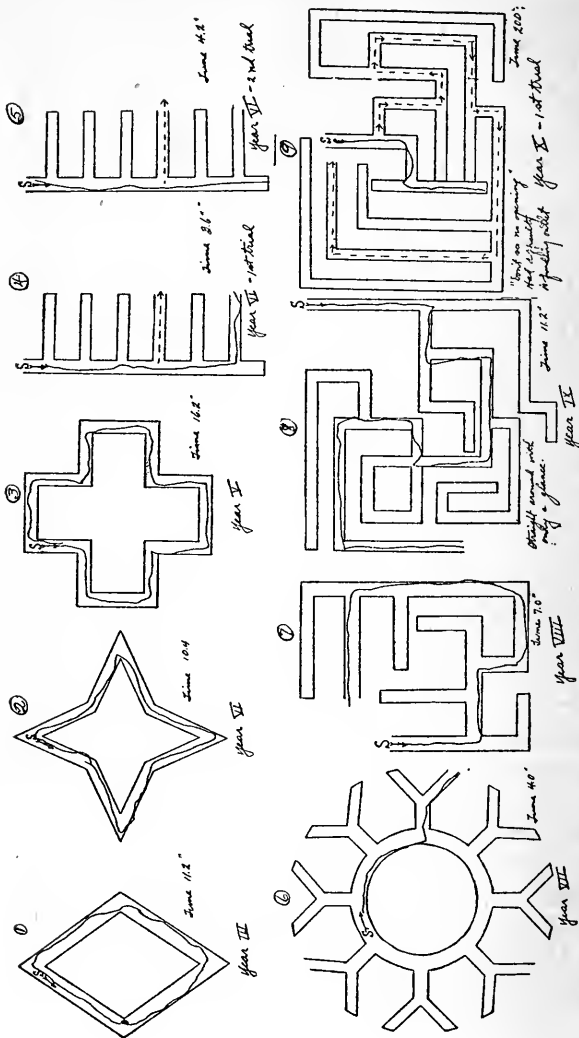
Healy pictorial completion test (46). In the illustrative example he had to be helped, having placed the apple where the wheel belonged. At 50" he put the books where the girl's hat belonged; at 75" put the bird-in-cage where the bird belonged; at

88" put the cherries in the apple basket space; at 100" put a blank in the foot-ball space; at 120" put a blank in the log space; then put the clock in the window, took it out and used it for the dog, and then laid it aside; at 165" put the chicken in correctly, then put the hatchet where the dog belonged; at 205" put the wrong cat in place; and at 225" put the unbroken window in place sideways. When asked if he was satisfied, he took out the unbroken window at 270"; then at 300" took out the bird-in-cage and put in the correct bird; at 325" he again replaced the unbroken window sideways; and at 380" was fully satisfied. Questioned on the hatchet he said the boy was going to cut down the tree. Questioned on the foot-ball he took out the blank and put in the foot-ball. Questioned on the cat he said the girl wanted to give the cat some milk. Questioned on the window he said, "It's a window," and when asked if it was put in correctly he changed it to the correct position. Questioned on the girl's hat he said, "That's a girl's books." Questioned on the apple basket he said, "Boy slung apples down." Questioned about the blank which he put in for the log of wood he said, "*That's dust,*" but later put in the sawed-off piece of log. To sum up, 2 placements were correct, 4 were illogical errors, and 3 were doubtfully log-

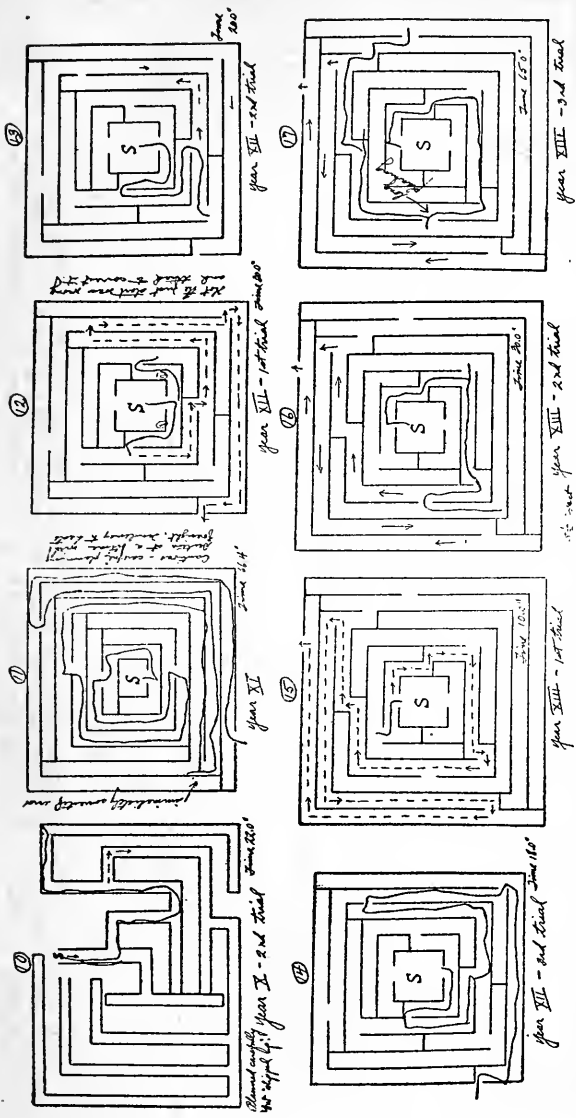
ical; total time 6'-20". This record fell below all the median averages given by Healy, but fell within the limits of variability of his second-grade eight-year-old children, and within the limits of his classes I, J, K, and M(d), which are all chronologically and mentally above 8 years. This boy was therefore at least "at age" and normal in this test, by objective comparisons.

In the *Healy construction puzzle A* (47), he "gave up" at the end of ten minutes, when asked if he wished to stop. In this test he made use of trial and error with very little planning. Still, he was versatile and "handy," made varied and rapid exchanges, tho profiting little from previous errors. He was conscious of his errors and did not persist in impossible moves. He did not recognize correct moves so easily as wrong ones. The same errors were seldom repeated. He was eager and persistent. Altho he failed to pass the test, the failure was not that of the feeble-minded of even the higher grades, but rather was like that of young normal children.

In the *Porteus motor-intelligence tests* (78) he passed tests 3, 4, and 5, missed 6, passed 7, 8, and 9, on the first trials, missed 10, passed 11 on the first trial, passed 12 on the third trial, and missed 13.



The Porteus motor-intelligence tests as performed by Walter D. His mental age by these tests was 9.5 years, according to Porteus' latest standards of scoring. The problem in the first three tests consists in tracing around the figure between the lines. In the other forms the subject is instructed to begin



at "S" and trace his way to the outside of the figure without going up any closed path. At each turn, consequently, the subject must make a judgment with caution and foresight. In this reproduction the forms are numbered in the order of successive trials, with the year value of each test designated by Roman numerals. For detailed description see reference 78.

According to the revised method of scoring¹¹ for these tests Walter would be rated at mental age 9.5. In some revised data (unpublished), Porteus has one subject of chronological age 8, mental age 7, who measured as high as 12 by these tests, but this was quite exceptional, and was not equaled by any other child of those ages. It therefore appeared that in these tests Walter did exceptionally well for his age. Because of the inherent qualitative difficulties which confront mentally defective subjects in this test, Walter's performance was especially indicative of potential normality.

In the *Kent-Rosanoff association test* (56) the mean average speed of reaction for 100 reactions was 5.8", the modal speed 2.0", and the median speed 2.7". The median, from the distribution, was the best central tendency, and was rather better than might have been expected for a normal boy of 8, and, judging by unpublished data, was much better than the performances of mental defectives of that mental age. There were 9 per cent failures of reac-

¹¹The original method of scoring allowed one to "credit the child with the highest age in which he succeeds" under the standard instructions, but we are advised by Dr. Porteus of a proposed correction in the method of scoring, according to which a year is deducted for each test completely missed, and a half year for each success which requires the full number of trials allowed.

tion, whereas the average per cent for his age, according to Rosanoff and Rosanoff (80), is 4.7 per cent. The words failed were the difficult words of the list for children of his age. There were 61 per cent common reactions (all specific), as against the 8-year average of 74 per cent. Doubtful reactions constituted 5 per cent, as against the normal average of 3 per cent. Individual reactions were 25 per cent, normal average 18 per cent. Of all individual reactions, 4 per cent were normal, 68 per cent pathological, and 28 per cent unclassified. The 68 per cent pathological were made up of 12 per cent derivatives, 20 per cent partial dissociation, and 36 per cent perseveration. While these results differ somewhat from the normal averages, they probably fall within the normal range of variability (not given by Rosanoffs). No definite indication of psychopathic deviation could be detected from these results. According to Otis' classification (71), 67 per cent of reactions were of Type 5. Compared with her standards, this boy would be classed as normal and not as feeble-minded. Eighty per cent of reactions were different words, and 20 per cent were reactions repeated more than once.

In *Whipple's steadiness test* (108) Walter was able with the right hand to hold the needle in hole

10/64 for 15" without contact, and with the left in hole 12/64.

In *Abelson's dot cancellation test* (1) he completed the first four lines in 118" with 2 errors. A feeble-minded child of mental age 8 would hardly succeed in this test without much longer time and many more errors.

The *Sommer testimony experiment, auditory stimulus* (87), was very difficult for him. He gave only 1 item in spontaneous testimony. On cross-questioning 7 items were correct, 5 "don't know," 5 suggested, 3 wrong, and 4 phantasies. On re-reading, only 1 item and no self-corrections were elicited. In the *Stern-Sommer testimony experiment, visual stimulus* (96), he scored 13 points on spontaneous testimony, and on cross questioning scored 14 points correct, 2 uncertain, 1 "don't know," 6 suggested, and 3 wrong. No standards for this test were available. The visual reaction was very much better than the auditory, but this did not necessarily indicate that he was visually rather than auditorily minded. The visual stimulus test appears to be much easier for young children, for other reasons than those determining imaginal type.

The tests given to this boy did not exhaust all the possibilities, but did represent the major lines of

examination. Many additional tests which seemed desirable could not be used because of the boy's inability to read or write. The tests which were used measured both general and specific abilities; how much of each was measured could not be judged, without introspection on his part, and this he could not give. The purpose was to determine whether the intelligence was potentially normal or potentially defective, that is, whether or not mental development might be expected to continue. The tests, one notes, examined the development of the general intelligence by way of the specific mental processes. They measured essentially, for the most part, innate capacities which are almost wholly independent of specific teaching. Some conclusions as to specific psychological traits might be drawn from the data, but that is not our present problem.

Conclusion. These test results warranted the conclusion that the boy was not only not feeble-minded at the time, but had none of the objective characteristics of the potentially feeble-minded coming within our experience. It was possible that the boy might be potentially feeble-minded, for he did show a few subjective signs of mental defect, but the weight of all the evidence of the mental tests indicated a potentially normal mentality. The Binet-Simon Scale

tests showed him somewhat retarded in intelligence, but in almost all the other mental tests he did better than might have been expected of the average normal boy of his age, and much better than the potential defective of his age. We therefore felt justified in concluding tentatively that the boy was normal and not defective. Nevertheless, inasmuch as this is the crucial test of diagnosis, not too much weight should be given to the conclusion. An absolute diagnosis probably cannot be arrived at until the boy is more than 11 or 12 years old.

Pedagogical data. Walter said that he attended school for two years when he lived in the Industrial Home of a large city. This report was confirmed by a high-grade mentally defective girl, formerly a resident of the same Home, who knew Walter while there and whose testimony in this respect was fairly reliable. He also said that he was in the "high second" grade of the school there, which was a regularly graded public school within the Home. A report from an officer of the Board of Children's Guardians of which Walter is a ward, stated, "Walter's teachers report that his marks for the years 1914 and 1915 were all unsatisfactory; that from September until November, 1915, he has had the mark of fair for reading, writing, spelling, hand-

work and deportment, and excellent in numbers." It appeared that this was the essential basis on which he was suspected of being mentally defective, but to us these statements appear to conflict. Certainly it is not sufficient evidence, as stated, to warrant a judgment of feeble-mindedness.

Our own examination for scholastic status showed that Walter could read easy passages in the first reader, but not isolated simple words; that he could write his name, and could write legibly from copy, but that he could not write from dictation; could count to a hundred, could add easy sums of two terms of not more than two digits each, and could multiply and divide easy two-place numbers by one-place numbers. He said that he had made a small chair in the wood-work class at the Home school, and during his brief period at The Training School he had made a small taboret, similar to what might be expected from a normal boy of his age.

He was affectionate, active, good-tempered, cheerful and polite. Judged by superficial observation, he appeared to have good purposive attention, and to learn easily by imitation or by verbal instruction. He had defective speech of a type which is very frequently met with in young mental defectives.

Medical examination. A thoro examination by

the School's physician yielded no significant data. The boy was considered physically normal in all respects.

Personal and family history. The report of the officer of the Board of Children's Guardians reads: "Our records show that the man (Walter's father) never supported the family and had been taken into the court for non-support several times before the children were committed (to the Board). It is the type of family that is known to all charities. The children were committed because the mother was not considered to be able to provide for them, even if organized charity provided the money. We have every reason to believe that Walter was born May 18, 1907."

At this writing the case has not been studied by a field worker. We could learn very little from the boy himself, for he had only vague ideas about the members of his family. From the mentally defective girl referred to above, who knew Walter at the Home, we learned that two of Walter's sisters were inmates of the Home, one aged 13 and in the second grade at school, and the other aged 14 and in the fifth grade. We learned from Walter that he had an older brother, aged probably 15, who "works in a store" and "helps my father," who works in the

same store. Walter spent two years in the Industrial Home and two months in another Home before coming to us for examination.

We must admit that these data are neither complete nor wholly reliable. This is most unfortunate, for the knowledge of the family history in this case might be of prime importance in giving rise to a tentative diagnosis. If one might be allowed to speculate in terms of probability, one might argue as follows: If the mother "was not considered to be able to provide for the children, even if organized charity provided the money," it is quite likely that she "cannot manage her affairs with ordinary prudence" and is mentally defective, assuming that the incapacity is due to mental inability and not to other factors, such as alcoholism. That the father "never supported the family" does not necessarily in itself argue more than a suspicion of mental defect, unless one assumes that this is due to *inability* to support them and not merely to disinclination. The twelve-year-old sister who cannot do more than second grade work is probably defective, by the pedagogical criterion. The other sister, who at 14 is in only the fifth grade, may be a high-grade mental defective or may be pedagogically retarded for other reasons than mental incapacity. (The mentally defective

girl referred to, who also came from this Home, was fifteen years old, and was in the "high sixth" grade, and had a mental capacity below 11 years.) The information about the older brother is not sufficient for any conjecture, and Walter himself is presumably normal, at least by the clinical tests.

These conjectures, then, so far as they are worth considering, show a probably mentally defective mother and at least one mentally defective child. The father must, therefore, be at least a simplex normal and may be mentally defective. In the former case Walter might himself be a simplex normal or a potential defective, as would also the older brother and the older sister; in the latter case he would necessarily be a potential defective, by the hereditary criterion. But unless both the parents could be shown to be unquestionably mentally defective the family history data would tell us nothing certain for the diagnosis of Walter himself.

Reports of officers. At the present writing Walter has been at The Training School for about three months. In the minds of those who deal with him there is about an equal division of opinion regarding his further mental development, and, therefore, his potential mentality. The supervisor of the boys in the School feels that Walter is much more like a

normal boy than the actual defectives and the potential defectives who have previously been under his care, but he adds the reservation that Walter does not stand out plainly as a typical normal boy, and is inclined to ascribe this to the probable effects of the boy's previous life under institution régime. The teacher of the academic studies in the school department sees no reason to consider Walter other than feeble-minded, even when her attention is called to the rather late age at which many normal boys learn reading and writing, and to the boy's evident success thus far in arithmetic. The teacher of basketry felt that Walter was a typical defective, but when her attention was called to the fact that he was classified with boys of his mental age who were chronologically much older, and to his accelerated physical development, she reversed her judgment and thinks he might be normal, altho he does not "stand out" clearly as of normal ability. The teacher of wood-work considers him clearly feeble-minded in spite of other data. The teacher of physical training considers him very probably normal, and feels strengthened in this conviction by the knowledge of his age and the results of the mental measurements. The teacher of knitting feels no hesitation in considering him a potential defective,

and holds to her opinion. The teacher of sewing is quite emphatic in asserting her belief that he is definitely feeble-minded.

We must record here one important observation regarding teachers' judgments of feeble-mindedness, namely, that teachers very naturally are prejudiced by the degree of success which the child has attained in their own class-work. These prejudices may be either offset or aggravated by the child's temperamental traits and deportment. It is quite difficult, therefore, for teachers to evaluate a child's intelligence in the face of his school reactions.

Conclusions. To sum up the clinical data in this case, it appears that by the Binet-Simon Scale tests there is slight mental retardation, but no objective or subjective data on which to base a prognostication of mental defect. The results of mental tests, almost without exception, indicate a mentality equal, if not superior, to his mental age. Anthropometric measurements show him two years superior to his age, with normal body proportions, except for a large head. Pedagogical data are possibly doubtful; the boy is too young and the standards too uncertain, under the circumstances, to be evaluated with surety. Family history is inadequate, but apparently is not good; there is a possibility that both parents

are defectives, in which case the boy would be expected to be also defective; but it is also possible that only one or neither parent is defective, in which case nothing definite could be foretold for him. The opinions of officers having the care of him contradict each other, with the weight of opinion favoring normality. He was committed to the school as a feeble-minded boy, but the evidence for this opinion is meager and insufficient. Subjective impressions of the boy give one the vague feeling that he is, after all, "like our other (feeble-minded) children," but there is no objective warrant for this impression, and the traits which give rise to it may be invalidated by the boy's previous history. We therefore come to the conclusion that the sum of evidence indicates a potential normality, but that this must, under the circumstances, be affirmed only as a tentative diagnosis, which cannot be confirmed within at least three more years.

Subsequent history. Walter has been re-examined for mental age four times since the preceding report was concluded. The writer examined him 4/26/16, and obtained a mental age of 7.8, retardation 1.1 years, I. Q. 88. We also re-examined him 6/8/16, and found a mental age of 8.2, retardation .9 years, I. Q. 90. On 6/9/16 a research assistant, using the

Stanford revision, obtained a result of 8.1. In this examination he passed all tests at years IV, V, VI, and VII; passed ball and field, counting 20-0, and similarities at VIII; passed making change at IX, 60-words at X, ball and field at XII, and missed all tests at XIV and above. The mental age by this examination is identical with that obtained the preceding day by Goddard's revision. On 7/31/16 a relatively inexperienced examiner retested him with Goddard's revision and established a mental age of 8.2, I. Q. 89. In these tests the basal year has only once been above VI, but the tests which were missed were not those which are typically difficult for defectives. The successive examinations show greater variability in details than in gross results, for the additional credits above the basal year are variably distributed. We note that the mental age has remained constant during these seven months of retesting, and shows no improvement, with the result that the I. Q. has decreased, so that he now classifies as borderline backward or normal.

He was remeasured 6/9/16 with the Smedley anthropometric tests. The results showed that he was average physically for boys of 10 years. The Smedley curve sloped downward because of the low vital capacity record. The slope was 86/64, and

had to be considered normal in type, since the psycho-physical average was above 50. This curve replotted for age 10 was also normal in type, with a slope of 68/50.

In his school work Walter has made definite progress, but not more than is usual for potential defectives of moron grade, and not so much as would probably have been made under similar circumstances by a potentially normal boy. School reports dated 3/13/16 stated that in academic work he could read in the first reader, could do second grade number work, but was slow in learning recitations; in physical drill he did well but showed poor rhythm; in music he was learning to play the baritone and "could play the scale of C, exercises and sustained tones, and 'Home, Sweet Home' with a little assistance"; in manual arts he had made a colonial mat; in needlework he "learned to knit very quickly and does nice knitting;" in basketry he was "doing good work for a beginner;" in brush making had done well and had made two brushes; in woodwork he had made one bench. In all these reports laziness and mischievousness were mentioned as interfering with his success.

Similar reports dated 6/1/16 showed fair progress in academic and physical drill work, very good

progress in music, both solo and harmony, and good work in all other branches. Again lack of interest and effort appeared to hinder his progress. In general, the principal of the school department, Mrs. Alice M. Nash, considers that he is not a normal boy and expects him to develop about as other potential defectives of moron grade within her experience. He is a mild disciplinary problem and has rather undesirable temperamental characteristics.

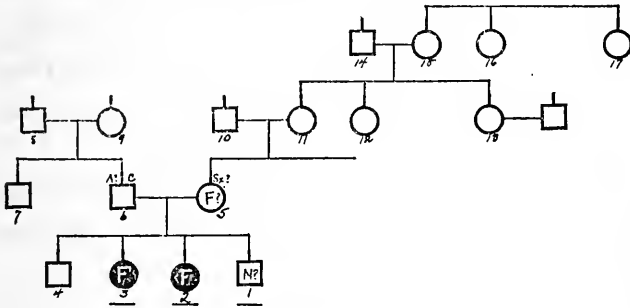
Family history. The family has been partially investigated by Miss Elizabeth S. Kite, but not very much directly valuable information could be obtained. The family resided in a Southern city, but was broken up in 1914 by local authorities. The father had twice been haled into court for non-support, and the mother could not take care of the family even when organized charity provided the money.

Following is a description of the family members as far as information regarding them could be obtained. They are described in order of the numbers on the chart (page 135):

1. Walter D. Our Case 3, described above. He must be considered normal by all the clinical data so far assembled, but there is a reasonable doubt of ultimate normality. He may be potentially feeble-

minded. He is now in The Training School as a ward of the X — Board of Children's Guardians.

2. Dorothy D., older sister, now a ward of the X — Board of Children's Guardians, now placed in the U — Industrial Home School. She is in



Family chart of Walter D. (see pages 134-140).

Legend: Circles represent females and squares males. Vertical lines indicate lineal descent, and horizontal lines marriages and offspring. "N?" signifies apparently normal; "F?" signifies apparently feeble-minded; "F" signifies definitely feeble-minded; "S_x?" signifies apparently sexually immoral; "A?" signifies apparently alcoholic; "C" signifies criminal record; symbol underscored signifies living in public institution; absence of marking signifies mentality undetermined.

the second grade in school there; has a record for petty thieving and running away; is considered unreliable. In the records of the B. C. G. her birth date is given as 6/2/04, indicating a present age of 12.4 years, which may, however, be incorrect. Miss Kite reports that Dorothy looks more like a child of

eleven years, which might indicate an actually lower life-age, or might indicate the characteristic inferior physical development of mental defectives. According to her sister Martha's statements her age is 13.4. In the Binet-Simon examination administered by Miss Kite, Dorothy passed all tests at year VII, missed counting 20 to 0 at VIII, passed only the definitions test at IX, and passed the sixty-words test and the rhymes at XI. The mental age by these tests was 8.4, and the character of the individual reactions was typically feeble-minded. If the age of 12.4 be tentatively accepted as correct, the I. Q. was 68, and retardation amounted to 4.0 years. She is therefore feeble-minded by the Binet-Simon tests, a conclusion which Miss Kite corroborates from her own impressions and additional evidence. Even if the life-age is placed too high she must be considered either borderline or potentially feeble-minded.

3. Martha D., oldest sister. The records of the B. C. G. give Martha's birth date as 12/18/03. This indicates a life-age of 12.9. Either Martha must be older or her sister must be younger, for according to these dates there are but five months between their births! She is larger and more mature than her sister Dorothy. She says that she will be fifteen in December, 1916, and that she is 18 months

older than her sister. Miss Kite reported: "She has a more developed mind than her sister, but with fewer flashes of light across it." "Her number work was instantaneous, but her ideas came sluggishly." "She showed marked intellectual indolence," and "at her best would surely be under mental age ten and a very dangerous sort to be at large." She is a ward of the X—— B. C. G., now placed in the U—— Industrial Home School, where she is in the fifth grade in school. In the Binet-Simon examination administered by Miss Kite, she passed all the tests at year VIII, missed only the definitions test at IX, passed the money and the six-digits tests at X, passed the sixty-words test and the rhymes at XI, and missed all the tests at XII. The mental age by these tests was 9.4, and the qualities of the reactions were markedly characteristic of the feeble-minded. If the recorded age is considered correct, her I. Q. was 76, and absolute retardation amounted to 3.1 years. She would therefore be considered feeble-minded by these tests, a classification which Miss Kite corroborates from her own impressions and additional evidence.

4. Isaac D., oldest brother. Little could be learned of this boy, who is reported as sixteen years old. His brother Walter stated that at the age of

fourteen Isaac was at work helping his father, and Martha stated that when the family was broken up Isaac accompanied his father to California.

5. Ida D., née M., mother of Walter. She could not be found by the investigator and nothing could be learned of her whereabouts. She is a member of the Episcopal church in X——. The wife of the Dean of the Cathedral had known Mrs. D. when the latter was married. She said that Mrs. D. was only fifteen years old when her first child (Isaac?) was born; that she was weak physically and morally, and possibly mentally; that she paid little attention to her home and was on the streets a great deal; that Mr. D. accused her of infidelity, but that nothing had been proved. Mrs. D. goes occasionally to see her children in the Industrial Home, and is said to be earning her living by attending a friend. The investigator felt that there was a reasonable probability that when seen Mrs. D. would prove to be a high-grade mental defective.

6. Charles D., father of Walter. The Dean's wife said that Mr. D. came of a much better grade of family and was brighter than Mrs. D.; that he had held a place working for a contractor for three years, with a maximum wage of eighteen dollars a week; that he had a criminal record. The oldest

daughter, Martha, said that her father drank, and often abused her mother, and once tried to cut her throat. Mr. D. could not be located and there was no clue to his whereabouts, except that Martha said that when the family was broken up (in 1914) Mr. D. went to California with the oldest son (Isaac). At least, nothing has been heard of them since 1914.

7. Uriah D., paternal uncle. He is a living brother of Charles D., but has not yet been visited by the investigator. There is no information regarding other possible siblings of Charles D.

8, 9. N. B. D., paternal grandfather, now living in Virginia; he has not been visited. Nothing is now known of 9, his wife.

10, 11. Mr. and Mrs. M., maternal grandparents. No information regarding them has yet been obtained, except that Mrs. M. is dead.

12, 13. Florence M., and Mrs. Marion T., grand-aunts, now living in X——. No information has yet been secured concerning them.

14, 15. Maternal great-grandparents; information is expected from 12, 13, 16, and 17.

16, 17. Maternal great-grand-aunts, who are now living but have not yet been visited.

Conclusion. Our conjectural argument, page 127, seems fairly well substantiated. One parent is prob-

ably defective, the other is of undetermined mentality; two sisters are defective (as conjectured previously by the pedagogical criterion), and a brother is undetermined. The family history is not sufficiently investigated to prove directly helpful, either for the diagnosis of Walter's potential mentality or in accounting for his ultimate mentality. The history is offered here to illustrate methodology and the sometimes extreme difficulty of securing information.

CASE 4

HELEN U. DEAF-MUTE, NEUROTIC OR PSYCHOPATHIC, BUT NOT FEEBLE-MINDED

Binet-Simon examinations. Inasmuch as this child is deaf and mute, and has no written or spoken vocabulary, the Binet-Simon examination is of comparatively little value. The writer examined her, however, as best he could, 7/24/14, age 8.1. By signs she was made to understand in some tests what was wanted, but could not be made to understand in others. She copied the square and the diamond, and succeeded in the "patience" test. She could not be made to understand the task in the comparison of lines, weights, and faces; lack of language precluded the use of all the other tests. The examination had to be discontinued because she suddenly exhibited a serious emotional state bordering on hysteria. (This emotional attitude toward the writer personally lasted somewhat more than a year, and now seems to have settled into an apparently normal childish affection.) From the general reaction to the Binet-Simon examination, supported by previous ex-

perience with normal and feeble-minded deaf children of different mental levels, the examiner judged that Helen's mental level was about 7 years. If one might accept this result at face value, allowing nothing for the deaf-mutism, Helen was one year retarded and classified as a borderline backward or normal child. But preliminary researches (results not published) have indicated that when the Binet-Simon tests are applied to young deaf children without language facility the intellectually normal deaf children test more than a year retarded if compared with the standards for hearing children.

In a second examination, 10 months later, age 8.8, a different examiner gave credit for the square, "patience," prettier faces, action in pictures, unfinished pictures, and the diamond; she could not make her comprehend the task of comparing lines and weights; the description of the action in the pictures consisted in very elaborate and detailed gesture-mimicry of the action portrayed. (Similar, tho somewhat less copious mimicry had also been obtained in the previous examination.) The assigned mental age was "7+". The writer re-examined Helen at the age of 8.9. Because of the lack of language no tests beyond year VII could be given, but she succeeded so easily in the tests that could be applied that we felt justified



TOP. Helen U., Nov., 1914, aged 8.4 years. Note the normal expression of embarrassment and coyness.

BOTTOM. Helen U., Nov., 1916, aged 10.4 years. Compare with her preceding portrait and note development.

1. The first part of the document
2. The second part of the document
3. The third part of the document
4. The fourth part of the document
5. The fifth part of the document
6. The sixth part of the document
7. The seventh part of the document
8. The eighth part of the document
9. The ninth part of the document
10. The tenth part of the document
11. The eleventh part of the document
12. The twelfth part of the document
13. The thirteenth part of the document
14. The fourteenth part of the document
15. The fifteenth part of the document
16. The sixteenth part of the document
17. The seventeenth part of the document
18. The eighteenth part of the document
19. The nineteenth part of the document
20. The twentieth part of the document

in assigning a probable mental age of "8-9?". Again it seemed that the results, if at all reliable, indicated an "at age" mentality. Whether this could be diagnosed as potentially normal or potentially defective was quite impossible to say because of several special difficulties, namely, the innate difficulty of diagnosing potential mentality, the examinational problem presented by deaf-mutes, the different standards for non-hearing subjects, and the apparent psychopathic complication. To these might be added still another, for later school work indicated a possible specific inability to learn language symbols. In this examination she copied a square inscribed within a square (which is somewhat more difficult than copying the diamond), copied two triangles superposed in the form of a six-pointed star (seldom passed by defectives of mental age under 9), and reproduced the Binet-Simon design correctly from memory (after 4 very brief exposures, however) with excellent reaction-attitude.

Obviously, at none of these examinations could an exact classification by mental age be made. For this case the Binet-Simon examination was valuable only as furnishing situations in which the child could be observed and compared with standard types. From such observations the writer concluded, at each ex-

amination, that the girl was not feeble-minded; she seemed abnormal but not subnormal. Indeed the reaction-attitude, on the whole, indicated rather more than average intelligence, in view of the very serious deprivation of hearing and speech.

Mental tests. This case shows exceptional need for the use of performance tests. A number of such tests were used. In their interpretation the quality of the reactions and the capacity for adaptation must be especially considered.

The instructions for these tests consisted of gestures and facial expressions to indicate the tasks. That Helen was able to comprehend such often-times vague directions constituted in itself one of the best indications of her potential mentality, for ready comprehension in the absence of copious instruction and direction is characteristically wanting in mental defectives. The conventional "natural" signs commonly used in communicating with trained deaf persons were avoided. The ideas of speed and accuracy had to be left for the most part to her innate "intuitive" appreciation of the purpose of the examining. The effect of employing too many signs in giving mental tests to deaf children is to produce only confusion.

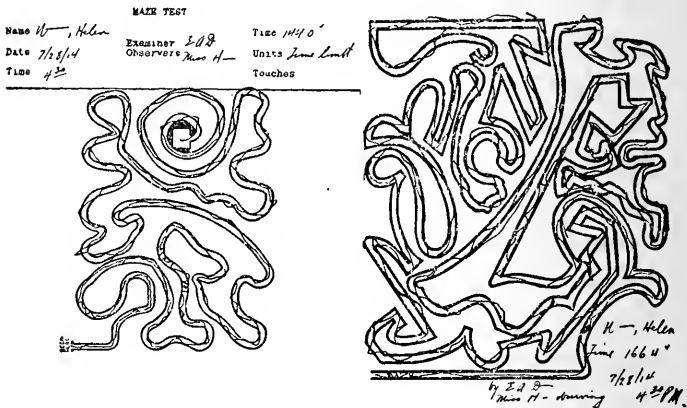
Anthropometric measurements. At the first ex-

amination, age 8.0, she was average in height, but much below average in weight, and still further below in strength of grip and in vital capacity. The Smedley curve showed a slope of 15/0 and was typical for middle-grade imbeciles; it corresponded fairly well with the assigned mental age, but showed defective rather than normal characteristics (18). A second curve, made one month later, gave a slope of 35/10, and showed high-grade imbecile characteristics. A third curve, at the age of 8.9, showed about an equal number of normal and defective characteristics. In all these tests the spirometer reaction was noticeably defective in character, unaccountably so in consideration of other tests. She had both lung power and lung capacity, but could not make use of them at the instrument, in spite of every help and encouragement; she blew hard and long but not thru the mouthpiece. One needs to qualify these interpretations somewhat, for the Smedley group of tests has not been standardized for deaf children.

Tracing. At age 8.1 she traced the *curved maze* (110) in 144", and immediately afterwards did the *combined maze* (110) in 166". In both tests there were many "touches." She exhibited good application of attention and ready comprehension. Learning was displayed in the relatively much lower speed

in the second maze, considering its greater complexity and extent. The test could not be given in the usual way and therefore the results had to be evaluated empirically and subjectively.

Adaptation board. This test (32) was difficult to



The curved and combined maze tests as performed by Helen U. The task consists in tracing between the lines as quickly as possible without touching them. Helen's speed for the curved maze (left) was relatively slow, but note the improvement in the combined maze, which, in spite of greater complexity and extent, was completed in nearly the same length of time as the other. The motor coordination expressed was poor, but the concentration of attention elicited was good evidence of intelligence.

explain, but Helen seemed to get the directing idea. Her record, at age 8.9, was: first turn correct on second trial, second turn on first trial, third turn on second trial, fourth turn on first trial. This same test, given one month later, was passed easily on all

turns, first trial. It will be recalled that Goddard's results show that the adaptation board is a standard 8-year test.

Healy construction puzzle A. In this test (47), age 8.9, at the end of three minutes she had not succeeded. The examiner then replaced the blocks in view of the subject with no other instruction, and she was then able to replace them herself in 30 seconds. One month later, she worked intelligently in this test, tho largely by trial and error, and was successful at the end of 2 minutes. She was then given the *Healy-Fernald construction puzzle B* (47), with which she worked persistently for six minutes. She then still had one piece wrong, which was the crucial error much earlier in the test, and when this was pointed out she immediately corrected it and finished the test.

Copying. She was asked to draw from copy a square inscribed in a square, and did so easily. She was then asked to copy two equilateral triangles superposed in the form of a six pointed star; this also she did without difficulty. The former test is standard, by preliminary data, for 8 years, and the latter for 9.

Burt dissected picture test. The material of this test was not the same as that used by Burt (9), but was patterned after his idea. The pictures used

were the plumber picture and the driver picture from Goddard's Binet-Simon set of eight pictures. The former picture was cut into nine equal parts and the latter into twelve. Helen was successful with the former in 278" and with the latter in 192". From preliminary data on a few cases, this speed is slow for normal hearing children of 8 years, but fast for feeble-minded hearing children of mental age 8 years. Of course it was difficult to give her the idea of speed. She took her own time and studied carefully both the copy and the cut-up pieces. She fitted the pieces together intelligently and without absurd mistakes, referring constantly to the copy.

Decroly picture arrangement test. A special set of "Foxy Grandpa" pictures was used as material for this test (17). After illustration with a sample 4-picture set, she seemed to grasp the idea that the pictures were to be shifted and arranged, but may not have understood the idea of logical sequence. She failed to pass this test, which is quite difficult, however, for normal hearing children of her age, and which rarely is passed by mental defectives of mental age 8.

Knox cube test. It was very difficult to explain to her the directing idea in this test (76). She finally seemed to comprehend but may not have fully under-

stood. She was not successful beyond line y (5 years).

Hearing. She failed to respond in any way to loud or sudden noises. So far as could be told by rough methods she was totally deaf.

Medical examinations. The writer urged a special physio-neurological examination, which was made and reported as follows by the research psychopathologist: "Irregular heart beat with faint systolic murmur. Apex beat visible in fifth interspace, quarter inch within nipple line. Absolute heart dullness. Slight scoliosis in lumbar region. Right patella jerk absent, left apparently normal. Patella loose on both sides. No clonus. Suspicion of Oppenheimer and Gordon reflexes on left side; no Babinsky. Protection reflex on right more marked than on left. Abdominal reflexes diminished; slight response on left. No glands palpable. Muscular tonus and passive resistance poor. Conjunctival reflex absent in left eye. Right eye slightly smaller than left. Nutrition poor. Blood count, red cells 3,960,000, white cells 18,600; differential count, 52 per cent polymorphonuclear leucocytes, 38 per cent lymphocytes, 2 per cent eosinophiles, 5 per cent mononuclear leucocytes, 1 per cent transitional, 2 per cent mast-cells; hemoglobin content 70 per cent;

color index 1.8. No pronounced abnormality of external speech organs."

As a result of subsequent anatomical examination and neurological observations by the research laboratory's biochemist (data not now available), Helen was classified as "a defective person in the common acceptance of that term" with an inference foreseeing "an unfavorable course of development."

Pedagogical data. At the first school examination she could not read or do any school work. Later school reports said that she was much interested, followed lessons watchfully, played and enjoyed games, behaved well, tried very hard, and was "quick to learn." Still later, 1/28/15, she was learning folk dances, could do a little weaving and was improving in it, could copy words and sentences written for her, could write her name and a few words without copy, could not read lips, could make a bed, could set a table with a little help, could iron well with direction, and was learning rapidly in needle-work and could "sew like a normal child." She learned a great deal thru imitation.

Personal history and personal characteristics. The family history was not investigated, but the parents appeared, from their correspondence, to be normal responsible people. On the application

blanks Helen is reported as learning to walk at 2 years, with a tendency to drag the feet. Her first tooth erupted at 4 months. She fell from a high-chair at 11 months, which is the assigned cause for the supposed retardation. She could walk upstairs normally, but would hesitate in going down (age 6 years). She could dress herself but could not bathe herself. Memory and imitation seemed good. She was deaf, right-handed, excitable, nervous, affectionate, obstinate, fond of lively play. She had had pneumonia and chickenpox. No significant etiological history was recorded.

At six years of age she was sent to a State School for the Deaf. After a little experience with her the superintendent of the school wrote the father that "Helen is feeble-minded and not simply deaf," and as a result of this opinion she was sent to The Training School. So far as could be judged from correspondence with this superintendent, there was no clear evidence of feeble-mindedness, but she was allowed to stay at The Training School for observation. Some time afterward Dr. A. L. E. Crouter, superintendent of the Pennsylvania Institution for the Deaf and Dumb, after seeing and observing Helen at The Training School concluded, without hesitation, that she was a normal deaf child with full

possibilities for training. Mrs. Crouter, herself for some time a teacher and student of deaf children, readily concurred in this opinion.

Social traits. Cottage reports showed that Helen was able to dress herself without help. She was neat and cleanly, and possessed dainty table habits. She seemed to delight in hitting and whipping other children, but in spite of a domineering temperament she got along well with them. She proved obstinate and rebellious. During a year's stay at The Training School she progressed rapidly in all social reactions and is now a pleasant, cheerful, amiable child. Her play, in particular, is striking in its normal characteristics. One day, for example, she played at giving a tea party to dolls and imaginary people, with stones for dishes and miscellaneous objects for viands.

Summary. The Binet-Simon examination is of almost no value in this case except for furnishing a few standardized performance tests, and in affording a rough estimate of the subject's mental level. Other mental tests, evaluated with due regard to the special deprivation of hearing, and the general and specific retardation of deaf children, and the limitations of performance tests in measuring general intelligence, point quite clearly toward a level of intelligence

rather above what one might expect of a normal deaf child of her age. Other mental traits seem slightly better than average, especially for a deaf child. But there is also distinct evidence of emotional disturbance, from which one might class her as a neurotic child. The data of the neurological examination do not permit of definite positive interpretation, but indicate that her nervous system is somewhat abnormal, and perhaps pathological. Learning, and social reactions, are as satisfactory as could be expected. The opinions of two experienced superintendents of schools for the deaf are conflicting, but that of the more experienced is in favor of normality. Family history is meager and negative.

Tentative diagnosis. Helen seems to be intellectually normal or above, with a possibility of mental instability; physically she is delicate, neurologically she is doubtfully pathological, pedagogically she is hopeful. This child is still in The Training School under observation. Final diagnosis cannot be made within at least several years.

Subsequent history. Helen was re-examined 10/16/16 by an assistant unskilled in the testing of deaf children. The results make no addition to the data previously recorded, but illustrate the need for spe-

cial equipment in the examination of deaf subjects.¹² Anthropometric measurements were taken at this time and showed all Smedley measurements above normal for her age (10.3), with the exception of vital capacity. The Smedley curve was normal in type, with a slope of 68/63. In physical measurements Helen was average for 11 years, and the slope of the curve plotted for that age was 44/52; the curve was strikingly normal except for vital capacity.

In all school work Helen has made decided progress under the comparatively intensive training which the school affords. Her teachers have not been specially trained in the methods of teaching deaf children. To the writer this progress indicates a considerable presumption of potential normality. This presumption is amply supported by many incidents in Helen's personal life, in which she has exhibited marked originality and resourcefulness, consistent

¹² From our own experiences in examining deaf subjects who ranged in intelligence from imbecile and moron children and adults to normal children and adults, with and without language facility, we are certain that no clinician is properly qualified to examine deaf subjects for intellectual status unless he has had first-hand acquaintance with the problems of both deafness and feeble-mindedness, in addition to considerable preparation in psychology and child-study. We take this occasion to thank Dr. A. L. E. Crouter and his co-workers at the Pennsylvania Institution for the Deaf and Dumb for many helpful suggestions and for additional case material.

Wednesday
March 3, 1915
All a sat
All a pun
are
green
apple



Handwriting H. Helen 3/3/15

SCHOOL WORK OF HELEN N.

LEFT. Sample of Helen's handwriting from copy after about six months of training, age 8.8 years.

RIGHT. Apron cut out and hemmed by Helen, age 10.4 years. This took her about three months, 30 minutes a day in class. She received no help except directions by signs. It is her second piece of work in this class, altho she had had some previous teaching in art needlework. Unfortunately the evenness of the cutting and the regularity of the hand-stitching do not show in the reproduction.

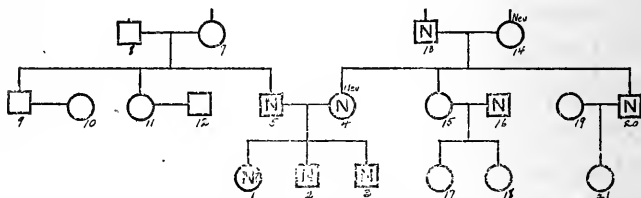
volitional application, and normal emotional reactions. Nevertheless, a vote taken among the teachers of the school department resulted in an equal division of opinion regarding her potential normality. Mrs. Alice M. Nash, principal of the department, after carefully weighing all factors, thinks that there is a reasonable doubt of either feeble-mindedness or normality, but feels, on the whole, that Helen is probably a potential defective of middle-grade moron type.

In any case diagnosis is extremely difficult and all judgments are affected by the complications of Helen's early age, her deaf-mutism, her unstable emotions, and her physical and neural pathology. With these disturbing factors it is extremely difficult to isolate the intelligence alone for evaluation.

Family history. Since the preceding clinical study was concluded, Miss Marion Nash has made a preliminary investigation of the family history. Altho at this writing she has been able to visit only the mother of Helen, she was able to secure a number of important facts. Before they may be accepted unquestionably, it will be necessary to obtain additional or corroborative information from other sources. It is rather interesting to observe that Helen's family is different from that reported in

our Case 3, being distinctly on a higher plane socially and mentally, and yet is not so good in these respects as the family of our Case 2. Whereas the G. family consisted mainly of professional and business members, the U. family members are mostly wage-earners. The family members are described below

FAMILY CHART OF HELEN U.



Family chart of Helen U. All family members are said to be normal, but only those have been labeled "N" for whom there was cited direct evidence of normality (see pages 155-162).

Legend: Circles represent females and squares males. Vertical lines indicate lineal descent, and horizontal lines marriages and offspring. "N" signifies normal intelligence; "N?" signifies apparently normal; absence of marking signifies mentality undetermined, but presumably normal. The individual members are numbered for convenience of description.

in numerical order according to the chart on this page.

1. According to our conclusion from the clinical study, Helen may tentatively be considered as a potentially normal child from the standpoint of intelligence, in spite of a neuropathic diathesis. The mother stated that the circumstances immediately preceding Helen's birth were not unusual in any

way; that the birth was normal; that Helen began to walk some time after the age of two years, and that this delay was ascribed to rickets by the family physician; that she began to talk at the age of seven months, when she could say a few words, such as "bye-bye" and "mama," and one day when out in her coach said "Bye-bye mama"; that her hearing was apparently normal up to the time of her first fall; that dentition was normal. She said that when Helen was eleven months old she fell from a high-chair and was unconscious when picked up. No effect of this fall was observed until Helen was about seventeen months old, when her grandfather discovered that she was deaf. She was taken to an Eye and Ear Infirmary in New York, where an operation for adenoids was performed. A specialist in New York to whom she was taken (age four years) ascribed her troubles to malnutrition, and said that she would outgrow them.

About this time Helen fell from a second-story window. This fall resulted in a compound fracture of one leg, with apparently no other effects. The mother further stated that Helen was examined in New York by Miss Alice Hinckley, later psychologist at the New York Clearing House for Mental Defectives, then specializing in correction of defects

of speech and hearing, who claimed that Helen could hear with the acousticon. Miss Hinckley subsequently included Helen as one of several subjects in an experiment in correcting defects of hearing. This research was conducted at The Training School at Vineland in the summer of 1914. In these experiments Miss Hinckley concluded that Helen did hear with the aid of the acousticon, and also on one or two occasions without it. At this time, unfortunately, Helen became seriously ill and the study could not be continued. Miss Hinckley was certain that the experience of hearing produced such a state of nervous excitement in Helen, who was easily upset and slightly hysterical, that the illness was the result. At least no other plausible reason could be discovered. It may be that Mrs. U. has confused the facts in associating these incidents with a visit to New York, for Miss Hinckley did not identify Helen as one of her previous cases, altho, of course, she might easily have failed to recognize her. At the age of five Helen was placed in a school for the deaf, but after a year there she was pronounced feeble-minded. Following this dictum she was sent to The Training School, where, as described in our clinical study, opinions still differ as to whether she is either actually or potentially feeble-minded, or is of normal

intelligence.

2. Karl, a younger brother, now 9.8 years old; a "bright normal-appearing boy in the third grade at school."

3. Samuel, youngest brother, now 6.5 years old. "He has just entered school and gets along well, coming home nearly every day with 'stars' on his papers."

4. Mrs. Fannie U., née N., mother of Helen; "a very nervous and sensitive type of person." She and the family live in a modest apartment house. So far as she could tell "there was no feeble-mindedness, insanity, alcoholism, or disease in the family on either side."¹³ Mrs. U.'s nervousness is attested by her nervous manner in speech and action. She said that when the children were young and she was so worried about Helen, she became so desperate

¹³Such sweeping statements are frequently made by parents or relatives without carrying much weight. They must be taken for what they are worth. In our family charts we have labeled N or F only those persons on whom we had specific evidence of normality or defectiveness either by the social or the pedagogical criteria, or by the evidence of mental tests, or by the investigator's personal judgment from interviewing the person himself. In these charts we have left as "undetermined" all adults and young children for whom there is no direct evidence for either normality or defectiveness, even in the face of such general or even specific statements that such persons are normal. The investigator is expected to secure the evidence on which such statements are based.

that she seriously thought of committing suicide. She was married at the age of 18 to Mr. U., who was then 20 years old. Mrs. U.'s sister Thelma, 15, married Samuel B., 16, a typesetter; the children of this marriage, Grace, 17, aged 2.9, and Sadie, 18, aged 13 months, are described as normal, but are perhaps too young for positive judgment. Mrs. B. herself, 15, is described as normal by Mrs. U., but the investigator did not secure direct evidence. Mrs. U.'s younger brother, Albert N., Jr., 20, is a clerk, married, and has a daughter, 21, six months old. Mrs. U.'s father, Albert N., 13, is a shirt finisher in New York City. His wife, Fannie, 14, is described by Mrs. U. as being extremely nervous; Mrs. U. thought it was inadvisable for the investigator to attempt to visit her, for "she would just carry on and cry." It seems, therefore, that there is possibly neuropathic ancestry in the maternal side of Helen's forebears, who are of middle class socially.

5. David U., father of Helen, is a railroad clerk. His correspondence implies a fair average normal intelligence. A married sister, 11, lives in the South. Another brother, 9, is also married and living in the South. No other information concerning them could be obtained, altho Mrs. U. said they were normal people. David U.'s father, 8, died of pneumonia at

the age of 76. His wife, 7, is now living with one of her children in the South.

Conclusion. Altho we have considered many members of this family as "undetermined" mentally, in the absence of direct evidence, there is a reasonable presumption that all family members are of normal intelligence. The family is of middle grade socially, self-respecting, conforming to accepted codes, industrious and provident. There is a possibility of neuropathy on the maternal side. By clinical evidence Helen is of potentially normal intelligence. If later evidence should prove her mentally defective, the cause of the defect might be ascribed to one or both of two serious falls. Certainly there is a reasonable probability that her deafness was due to the first of these accidents, which, altho common enough among children and often without evident results, might in her case have produced serious effects, just as one bottle out of ten might break in falling from a table, whereas the nine are not even cracked. She is said to have heard and spoken before this accident and not afterward, and there is not any evidence of inherited deafness. Her neuropathic traits might have been inherited or might have been complications from either of these accidents.

If Helen should ultimately prove to be mentally defective and one should attempt to prove the defect inherited, her parents must both be proved simplex, according to the argument already developed theoretically (page 47) and applied to our Case 2 (page 100). If she should continue to develop to ultimate normality, she might be either duplex or simplex and her parents might be matings Type 1, Type 5, or Type 6, all very difficult if not impossible to demonstrate.

CASE 5

BERNARD D. PSYCHOPATHIC WITH SLIGHT INTEL-
LECTUAL RETARDATION NOT AMOUNTING TO
FEEBLE-MINDEDNESS

Binet-Simon examinations. This boy was first examined at the age of 15.9, late in the morning of 6/15/15, by the writer, using Goddard's 1911 revision (33). He passed all of the tests at year VIII, was 5 days off in knowledge of the date, was uncertain of the pieces of money above one dollar, failed in the XII-year sentence and in the comprehension problems; he passed all the other tests of the Scale. The mental level by the tests was 11.2, basal year 8. He answered most tests very quickly and easily, but on some of them exhibited confusion. His verbal reactions were very elaborate. The 60-words test showed very marked dissociation and some evidence of "complexes," both personal and sexual. In the rhymes test he also showed a tendency to "go off on tangents." He interrupted many tests by irrelevant questions or by rambling and un-called for discussions. The examiner felt at once

that the boy was not feeble-minded by the intellectual criterion, and also that the Scale did not adequately determine his mental level, because of absence of higher tests (24, 61).

In the afternoon of the same day the examiner therefore made use of the Stanford Extension and Revision of the Binet-Simon Scale (98), without reference to the morning's examination. In this examination Bernard passed all the tests at year VIII, and the significant tests below VIII, passed all at IX except the date, passed all at X, XI, and XII; at XIV he passed vocabulary, picture interpretation, reversing clock hands, and problems of enclosed boxes; at XVI he passed fables and arithmetic reasoning; he missed all other tests at XIV, XVI and XVIII. The mental age by this Scale was 13.5, basal year 8, retardation 2.4 years, I. Q. 85, classification backward or dull-normal. Space does not permit of detailing the quality of the reactions in these tests. They were the same as in the morning, tho slightly less exaggerated. The examiner felt that the boy was not feeble-minded. The mental age was above 12, and the subjective impressions pointed clearly to non-feeble-mindedness. It was evident, also, that the boy was psychopathic and should be examined by a psychiatrist. Pending such examina-

tion a tentative diagnosis of dementia precox (unclassified) with slight intellectual retardation was offered, with the reservation that no stress be laid on the psychiatric classification, which was merely suggested. It was further suggested, in view of the mental instability, that the boy should be subjected to continued observation and testing. The examiner felt that much would be revealed by psychological analysis of the subject, but left this to a psychopathologist and confined himself chiefly to further examination of the intelligence proper.

Mental tests. *Anthropometric measurements* indicated that Bernard was average for 17 years in standing height and in weight, and for 15 years in sitting height. Strength of grip and vital capacity were average for 16 years. The Smedley curve, plotted at age, had the downward slope which is characteristic of mental defectives, but presented the specific characteristics of normals (18); the average slope was 75/65. Because all percentiles were above 50 the curve had to be considered normal.

In the four trials of the *form-board test* (108) he made one error, and the successive speeds were 20.0", 17.7", 14.8", and 14.2". The best speed was average for above 12 years. In spite of the good speed he seemed very awkward with his hands.

The *Kent-Rosanoff association tests* (56) were given next. As the boy showed signs of fatigue, this test was discontinued after the first 50 words. The median speed of reaction was 2.0 seconds, with a normal type of speed distribution. Eighty-four per cent of the reactions were common (76 per cent specific and 8 per cent non-specific), and 16 per cent were individual. Of the individual reactions 25 per cent were normal, 25 per cent unclassified and 40 per cent pathological (13 per cent derivatives and 37 per cent sound-reaction words). Of the common reactions 55 per cent were of frequency 100+, 26 per cent frequency 16-100, 7 per cent frequency 6-15, 5 per cent frequency 2-5, and 7 per cent frequency 1. Of the total reactions 92 per cent were different words; that is, given only once. On the whole this test failed to show feeble-mindedness. It afforded suspicions of psychopathic states but yielded no very positive objective symptoms.

This experiment was repeated one week later by the same examiner, under favorable conditions; with noticeably different results. All the 100 words were given. The speed was again normal (median 1.95 seconds, with no especially marked deviations). But only 62 per cent of the reactions were common (60 per cent specific, 2 per cent non-specific), and 29 per

KENT-ROSANOFF ASSOCIATION TEST

Name, BERNARD D.

Date, June 21, 1915, 10:30 A.M., by, E.A.D.

Stimulus	Reaction	Time	Pre- quency	Stimulus	Reaction	Time	Pre- quency
51. Stem	mem	2.4	0	76. Bitter	sour	1.8	222
52. Lamp	light	1.8	650	77. Hammer	hammering	1.5	0
53. Dream	red	2.6	0	78. Thirsty	thirsting	2.0	0
54. Yellow	black	1.3	24	79. City	cottage	2.0	0-N
55. Bread	button (head)	2.0	0 (0)	80. Square	saw	2.7	0
56. Justice	sure	6.2	2	81. Butter	squeak	1.7	0
57. Boy	ran	3.3	±	82. Doctor	doctor-in- law	2.3	0
58. Light	red	3.4	1	83. Loud	louding	1.3	0
59. Health	wealth	1.5	76	84. Thief	theft	1.3	0-N
60. Bible	holy	3.1	57	85. Lion	eating	1.8	±
61. Memory	izing (memorizing)	2.3	0 (1)	86. Joy	joying	1.5	0
62. Sheep	wool	3.3	143	87. Bed	went (inhibited "head")	4.5	±
63. Bath	bathing	2.1	6	88. Heavy	heavy boy	5.0	1
64. Cottage	ing (house)	3.0	0 (461)	89. Tobacco	sour	3.0	0
65. Swift	low	2.8	0	90. Baby	boy	1.0	32
66. Blue	red	3.8	54	91. Moon	light	3.5	231
67. Hungry	tiresome	2.1	1	92. Scissors	cutting	2.1	114
68. Priest	priesting	2.3	0	93. Quiet	hard	3.0	0
69. Ocean	depths	1.7	1	94. Green	black	7.0	13
70. Head	his	2.7	0	95. Salt	sour	3.8	18
71. Stove	load	2.8	0	96. Street	crossed	2.1	±
72. Long	short	1.8	413	97. King	rules	2.0	4
73. Religion	religious	2.1	2	98. Cheese	eating	1.8	29
74. Whiskey	drink	2.0	232	99. Blossom	flower	1.8	467
75. Child	man	2.3	41	100. Afraid	of him	2.5	0

Association reactions of Bernard D. in the last 50 words of the Kent-Rosanoff association experiment. Reactions are recorded as literally as the examiner's close attention made possible. The boy was instructed to respond as quickly as possible with the first word suggested to him by the stimulus word. The frequencies have been obtained from the Kent-Rosanoff list. This test is well within the range of Bernard's level of general intelligence. These 50 reactions are very much more abnormal than those obtained for the first 50 words. One notes, in particular, the high percentage of individual reactions, the reactions to preceding reactions and stimuli, the great number of participle reactions, and the normal type of speed distribution. For detailed analysis see page 166.

cent were individual, with the remaining 9 per cent doubtful. Of the common reactions 37 per cent were of frequency 100+, 32 per cent frequency 16-100, 10 per cent frequency 6-15, 10 per cent frequency 2-5, and 11 per cent frequency 1. Of the individual reactions 3 per cent were normal, 7 per cent unclassified, and 90 per cent pathological. Of

the 90 per cent pathological, 14 per cent represented derivatives of stimulus, 7 per cent sound-reaction words, 17 per cent sound-reaction neologisms, 7 per cent particles of speech, 7 per cent association to preceding stimulus, 7 per cent association to preceding reaction, 14 per cent repetition of previous reaction, 17 per cent neologisms without sound relations. Summing these, 31 per cent were partial dissociation and 45 per cent complete dissociation (of which 28 per cent was perseveration). This classification follows Kent-Rosanoff's order of preference and their objective criteria.

Only 80 of the 100 reactions appeared but once. Of the first 50 words, 34 were not the same reactions as were given in the earlier test. These results clearly warrant a suspicion of mental disorder, bordering on dementia, altho they do not, of course, give rise to a positive diagnosis. The comparison of Bernard's rather high proportion of individual and pathological reactions with the Kent-Rosanoff differential tables cannot be interpreted positively as indicating any of the disorders there classified, altho they agree more with the dementia precox group than with the others. Furthermore, as the authors specify, one cannot indiscriminately use the association test alone for this purpose. Nevertheless, the

results do indicate a not-feeble-minded mentality and a definite suspicion of psychopathic conditions.

The subject succeeded in the *Healy construction puzzle A* (47) in 95"; he used trial and error method at first, but showed good judgment toward the end. He also succeeded in the *Healy-Fernald construction puzzle B* (47) in 230", showing good judgment throughout.

With *Goddard's adaptation board* (32) he missed the first trial, but passed the second.

He succeeded with ease in all the *Heilbronner tests* (30, 48).

In the original form of the *Trabue completion test* (102), by preliminary standards,¹⁴ he passed at 8 and at 9 years, missed at 10, passed at 11, missed at 12, passed at 13, missed at 14, passed at 15, and missed at 16 and 17. This erratic performance, showing failures on some easy sentences, and successes on the more difficult ones, with the inconsistency and childish absurdity of many of the completions, again indicated mental abnormality, but not feeble-mindedness.

He failed after year 7 in *Pintner's standardiza-*

¹⁴These preliminary tests and standards were kindly supplied me by Dr. Trabue before his final results were published. The tests here referred to were made by the preliminary scale.

TRABUE COMPLETION TEST

Name, BERNARD D.

Date, June 21, 1915, 10:00 A.M., by E. A. D.

7. The kind lady *helped* the poor man a dollar.
14. When the *Boy* grows older he *can* be a man.
24. The *sun* rises *early* the morning and *at* at night.
27. It is good to hear *my* voice of *her* friend.
30. The boy who *played* hard *did* do well.
32. One's *duty* do *it* always express one's thoughts.
35. Brothers and sisters *don't* always *try* to help *each* other and should *not* quarrel.
37. Men *did* more *do* to do heavy work *than* women.
39. If a person injures one by *axadent* (accident) without having intended any *harm*, one should *be more* insulted.
43. The best advice *that* usually *is* obtained *from* one's parents.

Typical failures made by Bernard D. in the Trabue Completion Test (original form). The italicized words are Bernard's inserts to complete the meaning of the sentences. If the reader will imagine a space in place of each italicized word he may then complete the sentences for himself, which will give a better understanding of the significance of Bernard's completions. This test is well within his intellectual range. It shows marked dissociation of ideas and very poor auto-critical judgment.

tion of the Knox cube test (76); he passed lines *x*, *y*, *b* and *c*, and missed all the others. These failures were attributed to flighty attention and lack of concentration, rather than to real intellectual inability.

A test for motor control showed him unable to hold the needle free from contact in hole 6/64 in *Whipple's steadiness test* (108).

In the *Woodworth and Wells following directions test* (112) he passed the easy form in 82.0" with one error, the second form in 110.6" with three errors, and the difficult form in 147.0" with two errors. These results may be considered within normal limits for a boy of his age. They showed neither feeble-mindedness nor abnormality. Reliable standards are not available.

#3 D—, Bernard 6/21/15 By E.A.D.—

- With your pencil make a dot over any one of these
 + letters F G H I J, and a comma after the
 + longest of these three words: boy mother, girl
 Then, if Christmas comes in March, make a cross right
 + here..... but if not, pass along to the next question, and
 - tell where the sun rises... ~~in the east~~ If you believe that
 Edison discovered America, cross out what you just
 wrote, but if it was some one else, put in a number to
 - complete this sentence: "A horse has... 10 feet."
 Write *yes*, no matter whether China is in Africa or not
 + *yes*; and then give a wrong answer to this question:
 + "How many days are there in a week?" 5
 + Write any letter except *g* just after this comma, a and
 + then write *no* if 2 times 5 are 10. no Now, if Tues-
 + day comes after Monday, make two crosses here XX ;
 + but if not, make a circle here..... or else a square here
 + Be sure to make three crosses between these
 + two names of boys: George XXX Henry. Notice
 + these two numbers: 3, 5. If iron is heavier than
 + water, write the larger number here 5 ..., but if iron
 + is lighter write the smaller number here Show
 by a cross when the nights are longer: in summer? ~~no~~
 + in winter? X Give the correct answer to this ques-
 + tion: "Does water run up-hill?" no and repeat
 + your answer here no Do nothing here ($5 + 7 =$
 +), unless you skipped the preceding question;
 but write the first letter of your first name and the last
 letter of your last name at the ends of this line:

+ a e
 Total time 147.0" errors - 2

Woodworth and Wells following directions test as performed by Bernard D. The speed is only slightly longer than the slowest of the authors' educated adults, but the specific errors are rather unusual.

The *Sommer testimony experiment, auditory stimulus* (87), very plainly brought out evidence of abnormality. The memory span for ideas was very narrow, and the reactions teemed with lack of orientation, with fantasy, and with marked suggestibility.

Medical examinations. Two thorough physical examinations were made, one by the resident physician and the other by the research biochemist. Both examinations showed only negative results except for knee-jerk, which in one examination was considered absent and in the other apparently slight. The second examination also reported a "suspicion of a tendency to habit-spasm" and a "lack of neuro-muscular repose." The second examination further stated that "conversation and demeanor under natural but designed conditions show mental abnormality," but that "the physical examination shows very little."

Pedagogical data. No standard pedagogical tests were administered. All reports of his school history agreed that he could do sixth grade work easily, and when "in form" could do eighth grade work, tho with difficulty. It was clearly evident from some rough tests of scholastic ability that he possessed a degree of pedagogical achievement which is rarely reached by feeble-minded persons of even the high-

est grades.

Personal history. Bernard apparently developed as a normal child until between two and three years of age. His father said, however, that he was retarded in learning to walk, and even more retarded in learning to talk. The father also said that during gestation the child was unwelcome to the mother, who sometimes abused herself physically in apparent efforts to rid herself of it. After his birth she did not treat him with love or discretion, and seemed, in his later childhood, to have a bad influence upon his disposition and traits. The father also stated that when Bernard was a baby his grandfather abused him in various ways, such as taking him to saloons and giving him alcoholic drinks, annoying and frightening him, and in general initiating bad personal habits.

At about the age of three years "something happened," for the boy seemed different thereafter. He exhibited queerness, did not play well, and appeared absent-minded and preoccupied except when his attention was gained by certain interests. He was noticeably "nervous." He had measles when one year old, whooping cough when four, and scarlet fever when ten. He attended public school for six years, and then was sent to various private schools and

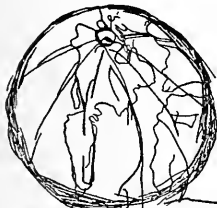
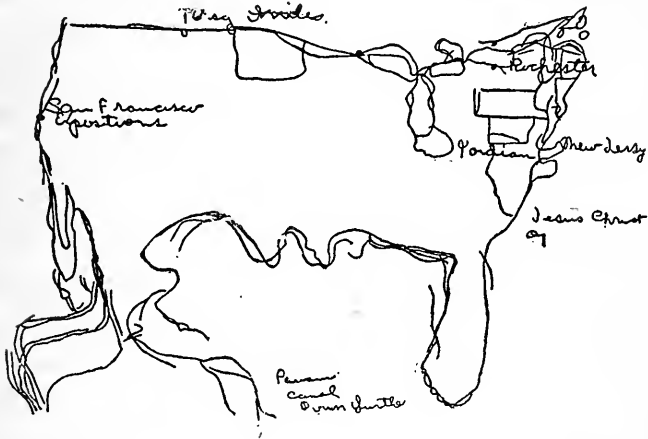
tutors. He is said to have acquired ability to do eighth grade work, with better aptitudes for arithmetic and geography than for other school subjects. In school work he was erratic and peculiar, made no friends, and was the butt of his fellows' pranks.

During his stay at The Training School he read indiscriminately, but always wanted reading matter at hand, and even carried various kinds of printed matter about with him when at work. And yet he read desultorily and without purpose. When left alone with pencil and paper he made many peculiar drawings and maps, and wrote pages of garbled "stuff." For example one of his papers written in a moment of leisure runs as follows:

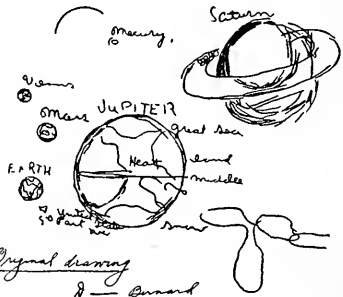
Mars is a World $\frac{2}{3}$ as big as This World. It is located 300000 degrees away from the Sun. It has a North and South Pole twice as big as ours The Eskemos are very brown and healthy up there because of the superb location. It is twice as green as our World. It has canals and landing places for passengers The canals or fifty miles wide. The schools are the same as ours There are places or State areas of ground for Indians. long in the Year 189 the white men conguered the Red men who then inhabited It the Wild men in the forest have to fight for there living for food. Mars climate is $\frac{1}{2}$ that of ours twice as cool. The snow is twice as deep. There are maney places like Interlaken for feeble-minded crazy methods and etc. It is divided up into sections each with a ruler over It. There are provinces to The government is bum because It was newly begun It is twice as hard to . . .

This essay is illustrated with drawings of the solar system and with an enlarged view of Jupiter.

Original drawing D., Bernard. June, 1916



Original drawing D., Bernard
June, 1916



Original drawing
D., Bernard
June, 1916

Original drawings made by Bernard D. of his own volition in moments of leisure.

Family history. The ancestral data are meager

and not verified. The father and close relatives were people of wealth and culture. In spite of probably neuropathic stock the ancestors on both sides were such as would be considered "good families," that is, of recognized social standing. From the father's description it appeared that the mother was of the periodically insane type or was at least neuropathic. This characterization was supported by the father's sisters, who told substantially similar though much milder stories. The application blanks gave "neuropathic ancestry" as a cause for the boy's condition.

Previous examination. The boy was examined clinically by Dr. Lucius Button before being sent to The Training School. Dr. Button assigned a mental age of 12 by Goddard's Revision of the Binet-Simon Scale (including the tests beyond XII). In Dr. Button's opinion, supported by copious data, the boy seemed "to be not typically feeble-minded but perhaps belonging in the pre-dementia-præcox state."

Personal and social characteristics. It would take too much space to list Bernard's interesting and illuminating sayings and acts; we can mention but a few. In appearance he was tall and of medium weight for his age, was pale and listless, with an habitual facial frown and an irrelevant sort of in-

quisitiveness. He spoke constantly about himself and his personal affairs, was distinctly egotistic and self-centered in his thinking, tho one might not have said introspective. He once asked, "If I had a hole bored in my brain and a small silo put in would it strengthen my brain?" His father said that he was an excessive masturbator, and that he had made serious and earnest efforts to break the habit, but without success. He was absent-minded in a preoccupied sort of way; for example, he undressed before the open window altho he was not immodest and had no evident desire to exhibit himself. He had a mania for reading, but seldom read two successive pages, and in many other traits he was eccentric and erratic. He drew heavy lines across the neck of his father in a picture, drew other lines around the head and labeled the picture, "Father's head cut off." In another picture, portraying himself and his mother, he drew lines thru her neck, breast, and waist and wrote across the picture, "Mother cutt in three parts."

Diagnosis. On the basis of the Binet-Simon examination and the mental tests the writer submitted this opinion: "I feel that Bernard is not feeble-minded in the ordinary acceptance of the word, and most certainly not so on the basis of mental capacity

and characteristics. He shows a mental retardation of only two years and a mental level of 13.5. In other tests he also shows an intellectual capacity above that of the highest types of institution cases. But there can also be no doubt that he is not of normal mentality. In appearance he shows mannerisms, nervousness, flighty attention, lack of mental and physical tone, and marked childishness, a sort of immature precocity of mind. Before more than this may be said with any certainty he should be examined by a competent psychiatrist." The suspicion of dementia præcox was also presented as a possibility.

Psychiatric examination. A psychiatric examination by Dr. Adolf Meyer was obtained several months later and resulted in the following diagnosis: "The enquiry in the direction of abnormal tendencies of a dementia præcox nature had very meager returns apart from the fact of obsessive thinking and limitation of associative thinking to rather narrow ruts. The case is one of constitutional defects with dementia præcox ruminations but without any delusion formation or hallucinosis."

Subsequent history. Bernard was removed from The Training School in the fall of 1915 and placed in a hospital for the insane for observation. He remained there for some time, but we have not the

data resulting from this observation. Later he was taken from this hospital and placed in charge of a young man who taught and amused him for a period of two weeks. About this time he became quite violent, swore more than usual, was extremely noisy at night, threatened to kill his mother, rushed after her with an old gun and pounded on her locked door with all his strength. He was then placed in a private hospital for the insane. The day they took him to the hospital he was mild. He thought he was going on an auto trip with his father. It was not until he was in the office and had met the examining physician that he became suspicious, and it was with great difficulty that they finally overcame his violence. At this writing no further history is available.

CASE 6

TERESA T. HIGH-GRADE BORDERLINE IMMIGRANT.

Special circumstances. Teresa, a Russian Jewess 20 years of age, came to America from Russia in July, 1914, with her parents. Her two sisters and four brothers had come to this country the preceding year. The officers at Ellis Island suspected that she was mentally defective, but sanctioned her admission to the country under bond, on condition that within a year she be proved not mentally defective, or be cared for at private expense at an institution for feeble-minded persons, or be deported. In case of deportation it was required that some member of the family, father, mother, or brother, accompany her. As the European war had already involved Russia by the time Teresa's status was defined, it is obvious what the situation meant to the family. In February, 1915, notice was served to the family that the conditions of the bond must be met within the stated time or the bond be forfeited. It appeared that in the meantime either the family had not known what to do, or had lived in the vain hope that

Teresa's case would be forgotten or passed by in the complicated mazes of Ellis Island records.

But on 3/16/15, age 21 years, she was brought to The Training School at Vineland, ostensibly as a candidate for admission, but actually for differential diagnosis. Dr. G., a local physician, accompanied her, as did also one of her brothers. Dr. G. stated that he was interested in the case thru his wife, whose uncle had been a patron of the girl's father in the little village back in Russia.

First Binet-Simon examination. With this information the writer undertook to give the Binet-Simon tests as a preliminary examining method. The girl's older brother and Dr. G. were present. The latter acted as interpreter, for Teresa had very little command of English. The men assured the examiner that she was cognizant of the purpose and import of the examination, and was, in consequence, in a highly excitable state. The latter was all too obvious. Mental examination was therefore very difficult, and the results obtained were somewhat open to question. It was evident that she had poor vision altho this was not so defective as to interfere seriously with the administration of the tests. She was very nervous, excitable, and emotional, was easily upset and had to be managed with great care. Comprehension

seemed "foggy" and all reactions were very slow. After a time the brother was dismissed. His leaving materially relieved the girl's tenseness. Dr. G. was kind and sympathetic toward the girl. He was instructed to interpret literally and as completely as was consistent with retaining meaning and form. The examiner was able, thru acquaintance with conversational German, to follow the dialectal translations of directions, altho he could not be so certain of the girl's responses. In the Binet-Simon tests she successfully compared the two weights and copied the square at year V; she knew morning from afternoon, right from left, and chose the prettier faces at year VI; at VII she easily passed all the tests; at VIII she succeeded in all the tests if slow speed were allowed on counting backwards, repeating days and counting stamps; at IX she missed all the tests (definitions not given); and at X missed knowledge of coins and repetition of 6-digits. At this sitting no other Binet-Simon tests were given. Of course the Binet-Simon tests had to be credited in the light of the special circumstances surrounding the examination, and with regard for the limitations of the American Scale in testing an alien.¹⁵ As a result

¹⁵ It may be noted in passing that the examiner's ability to satisfy himself as to the validity of Binet-Simon results, as indeed

of this partial examination the mental age was tentatively estimated as "8?". Because the examination conditions and results were unsatisfactory, it was recommended that the girl be placed in The Training School for a period of observation.

Second Binet-Simon examination. On 3/25/15 Teresa was re-examined with the Binet-Simon Scale with the aid of Dr. G. A young woman psychologist, who had in the meantime become well acquainted with Teresa, and who, by administering many different mental tests, had made her feel at ease under testing conditions, was also present. At this second examination Teresa failed to repeat 5-digits (which she just barely passed before); missed all of the tests at year IX; named the pieces of Russian money, missed on the design, and the sentence, but passed comprehension at X; succeeded in the absurdity questions readily, missed on 60 words, and rhymes (dissected sentences could not be given) at XI; passed abstract definitions, suggestion, and

of other mental test results, is a necessary prerequisite in the administration of the tests. It should be unnecessary to state such a commonplace, but in many published articles this fact is overlooked. It hardly need be said, either, that in this and in the next examination the examiner was on the lookout for evidence of special coaching in the tests, and also that the evaluation of the test-results was made in view of the girl's personal history and the accompanying circumstances.

comprehension problems at XII. Reaction qualities were contradictory, sometimes good and sometimes very poor. Flashes of intelligence were offset by evidence of rank stupidity. Mental age was estimated at "9-10?". Judging from some unpublished standards for these tests secured by Dr. H. H. Goddard on Russian Jews at Ellis Island, she would rate in the Binet-Simon as a high-grade borderline feeble-minded, or as a low-grade borderline normal. The quality of her reactions suggested stupidity and confusion as much as they indicated mental defect.

Mental tests. At the time of the first Binet-Simon examination Teresa passed the *Demoor size-weight illusion* which is a standard test for mental levels above 7 (19). In *Healy's construction puzzle A* (47) she was unsuccessful at the end of three minutes. After being shown, she was still unable to replace the blocks, and persisted in an early error. She showed confusion and evident self-consciousness, two disturbing elements in any test of a puzzle nature, but at the same time she showed little resourcefulness. With the *Healy-Fernald construction puzzle B* (47) she was successful in three minutes; she may have been aided by the experience in puzzle A. Dr. H. H. Goddard's preliminary results for these puzzle tests with immigrants indicate that they are

of little value with such subjects.

With Goddard's *adaptation board* (32) she was successful in all trials. *The Smedley anthropometric curve* (18) showed the typical upward trend of normals, but most of the specific feeble-minded characteristics. Height was average, weight somewhat above average, strength of grip also above average, with left much higher than right, and vital capacity very low; the average slope was 44/49. The Smedley curve at the second examination, 9 days later, was almost identical with the first.

In the *form-board test* (108) the first trial was completed in 44" with 3 errors, second trial 30" with 2 errors, third trial 42" with three errors, with poor bi-manual coordination, and fourth trial 33" and 1 error. A second form-board test several days later showed a best speed of 28" with 1 error. The best form-board reaction was average for normals aged 5 to 6 or for defectives of mental age 6 to 7. Dr. Goddard's results for this test with immigrants show that it is of doubtful reliability with such subjects as a measure of intelligence level.

A rough *test for myopia* was made with the McCallie vision cards, illiterate set (29, 66). By this test vision proved 5/20, with no noticeable difference for right and left eyes. The eyes were weak

as well as myopic, and the conjunctivæ were inflamed.

Teresa was able to write her name (in English) tho with difficulty. She could not write numbers, but with half an hour's teaching she learned this sufficiently well to do the *Woodworth and Wells substitution test* (112) the next day. In this test the speed per line from the first line to the tenth was, in seconds, 120, 80, 65, 105, 65, 70, 65, 60, 60, 50. She made 2 errors in the second line, 1 in the third, 1 in the fifth, and 1 in the sixth. The inability to write easily was a serious handicap, and some allowance was necessary for her poor vision.

Pintner's arrangement of the Knox cube test (76) was given separately by the assistant. In this test Teresa proved extremely stupid (no interpreter present). She seemed unable to comprehend instructions in spite of repeated demonstrations. She was successful with lines *a* and *y*, but perhaps by chance.

In the *Decroly picture arrangement test* (17), under similar circumstances, she proved equally stupid and failed utterly.

Motor coordinations were so poor that an attempt was made to measure this ability, using the *Healy controlled tapping test* (47). She completed the page in 90" with a noticeable increase in speed per

J—, Teresa Examined 2/28/15, By E. A. D.
 ☆ ② ③ ⊕ △ (2 witnesses)

②	☆	③	⊕	△	☆	②	③	△	⊕	120"
^x ②	^x ⊕	☆	△	⊕	④	☆	△	③	②	80"
☆	②	③	☆	③	⊕	△	^x ②	⊕	☆	65"
⊕	③	△	②	⊕	③	☆	③	②	△	105"
^x ⑤	☆	⊕	△	☆	△	②	☆	△	③	65"
⊕	^x ②	△	☆	②	③	☆	△	⊕	②	90"
△	⊕	②	⊕	③	☆	⊕	②	③	△	65"
②	△	⊕	③	⊕	△	②	☆	△	③	60"
☆	⊕	③	②	△	☆	③	⊕	②	☆	60"
△	③	②	☆	②	⊕	△	③	☆	⊕	50"

Comprehension abstr.: Had had some practice on preceding day. Not skilled at writing Total time 740" errors - 5.

The Woodworth and Wells substitution test as performed by Teresa T. The speed was very slow and the errors many. Teresa had difficulty, however, in writing the numerals, for she learned to do this only the day before. She had not learned the key by the time she had finished the page, but referred to it constantly.

line.

Hearing. There was a noticeable defect of hearing, but its extent and seriousness were not measured. It rendered the examining a little difficult, but did not invalidate any of the tests.

Appearance. Teresa immediately impressed even casual observers as a high-grade imbecile. She showed poor physical tone, an expressionless face, a dull voice, and an indifferent manner. She was neither so alert nor so curious as might have been expected. Her features were coarse and her general physical proportions not prepossessing. She was emotionally unstable, but this might have been due to accompanying circumstances whose significance she seemed to appreciate, a hopeful sign. One could not tell how much weight to ascribe to the effects of probable coaching and the adjuring to appear well, which resulted in an evident and most undesirable self-consciousness and timidity.

Physical examination. Altho a physical examination was much to be desired, it could not be obtained at the time. In particular a psychopathological examination was needed. These data might well have cleared up some of the contradictory and confusing results of the mental examination. Their absence emphasizes their importance in the interpretation of

the results of the mental tests.

Pedagogical data. Teresa had no school ability except that she could write her name, could count like a first grade child, and could do the simplest additions and subtractions. She had had no schooling. She seemed to learn easily when shown, but did not exhibit more potentiality in this direction than an untutored moron.

Personal history. Dr. G., previously referred to, was able to give some information about the family and personal history. He desired to be honest and unprejudiced, but was human, of course, and presented her case as favorably as possible. He said that both parents were normal people, but were neither bright nor educated. The father was a tailor, which is considered a very low social position in their native village.

A girl in such a family would have neither educational nor social opportunities for development, but would be trained in household arts of cooking and sewing. Therefore Teresa had never been to school. Her personal developmental history appeared entirely normal. This, however, is not at all unusual with high-grade defectives of the non-accidental type. It was expected that she would attend night school in this country, but she had not done so, she

said, because of her family's financial difficulties. She lived in New York with her parents and worked in her uncle's tailor shop. There she earned six dollars a week and was considered an able and intelligent worker. Under these living and working conditions she had associated almost exclusively with people of her own race and family, and had, therefore, no greater social or educational advantages than before coming to this country. Dr. G. further said that she had always had weak eyes. He accounted for some of her failures in the Binet-Simon tests on racial grounds, but evidenced considerable impatience, as did her brother, at her failure in other tests. He insisted that she was entirely normal for her race and station.

Industrial and social. From officers' reports obtained during the week of observation at The Training School, it appeared that Teresa was capable in the kitchen and was clean and careful about her work and her person. She seemed very sensitive and unhappy and cried a great deal. She held herself aloof from the "children" of the school and kept to herself. She was good at sewing and showed initiative in this respect. The principal of the school department felt that "she seemed like a highly trained (industrially) high-grade imbecile," and that "she

lacked normal responses and accepted situations too readily."

Summary. At the conclusion of the week of observation and examination, the writer confessed himself unable to make a satisfactory differential diagnosis. Too many disturbing factors were present and there was no adequate means of allowing for them. The results of the tests conflicted. In them Teresa showed some characteristics of normality, some of middle-grade morosity, and many of low-grade imbecility. Physical and psychiatric examinations were necessary but lacking. Social and pedagogical data were also not fully satisfactory. So far as could be learned, the girl's parents and siblings were normal, but not, perhaps, very intelligent. In general the results of the mental tests strongly indicated that she was a high-grade mental defective, but in the light of conflicting data and compensating circumstances the benefit of the doubt was allowed her, and she was tentatively classified as a normal person of low-grade intellectual capacity.

The case was referred to the Director of the Laboratory, Dr. H. H. Goddard, who reported as follows: "On the whole I do not feel that she should be kept in this Institution. Our knowledge of this problem of race and environment is still too meager

to warrant us in taking drastic action in these doubtful cases. It is quite probable that were she to remain here, her worrying and unhappiness would work more seriously upon her mind than any good that could come to her.

“I therefore recommend that she be not received at this Institution, at least not until she has tried life outside and has shown by some outward acts that she is incapable of managing herself and her affairs with such prudence and success as is customary with people of her class.”

Teresa, therefore, was returned to her people as not being a suitable case for institutional care. Since her departure we have been unable to learn the subsequent facts of her life.

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NOTE: This bibliography is representative only. It contains the more easily accessible references and only those which serve to amplify the text of this book. So far as possible duplication of authoritative aspects of feeble-mindedness in relation to diagnosis has been avoided. An exhaustive "Bibliography on the Social Aspects of Feeble-Mindedness," by Mr. Leland W. Crafts, has just appeared from the press of the *Journal of Psycho-Asthenics Monograph Supplements*.

THE HISTORY OF THE
CITY OF BOSTON
FROM 1630 TO 1800
BY
JOHN H. COOPER
NEW YORK
1845

GLOSSARY OF TECHNICAL TERMS

This glossary is appended for the use of readers and students not versed in the technical use of the terms defined. The terms are such as are not found in the ordinary dictionaries or are not there defined in their specific technical meanings. It is the purpose of this glossary to interpret and formulate these terms in their more recent connotations in clinical psychology or in their specific meanings as used in this book.

"ACCIDENTAL." Used in this book as opposed to **HEREDITARY**; applied to conditions caused by traumas, toxins, or diseases.

AMENTIA. Synonymous with **FEEBLE-MINDEDNESS** (q.v.). The British generic term for all classes of mental deficiency.

ANTHROPOLOGICAL. Used in this book in relation to the physical characteristics of persons; used more generally in relation to any phase of the study of man.

ATAXIA. A condition characterized by imperfect motor co-ordination.

BACKWARDNESS. Intellectual subnormality not

amounting to feeble-mindedness; used as a classifying term without reference to prognosis; used as a diagnostic term with the implication of ultimate normality.

BASAL YEAR. The highest mental year, in a year scale of intelligence tests, where all tests are passed, provided that no tests are missed in any lower year.

BIOCHEMICAL. Pertaining to the chemistry of living organisms.

CEPHALOMETRIC. Pertaining to measurements of the head as it is in life (as opposed to measurements of the skull, craniometry).

CHAMAECEPHALY. Flat-headedness; used of a cranial index where the height-length ratio ranges from .65 to .70.

CLASSIFICATION. A status which does not necessarily constitute a diagnosis (q.v.).

CLINICAL. Pertaining to actual examination or observation of individuals, often for purposes of instruction, as distinguished from theoretical or logical considerations; also more recently used in psychology in reference to individual case examinations leading to practical recommendations, diagnosis or treatment, as opposed to theoretical scientific deductions.

CLINICAL SYLLABUS. An outline for clinical or individual examination or study.

CLINICAL VARIETIES (of feeble-mindedness). The types which are essentially of "accidental" or pathological origin.

CRETIN. A pathological type of feeble-mindedness, usually of imbecile grade, caused by thyroid insufficiency, and characterized by certain relatively constant mental and physical traits.

CRITERION. A standard of judging.

DEFECTIVENESS. In common usage synonymous with MENTAL DEFECTIVENESS (q.v.); more exactly, imperfection of any sort.

DIAGNOSIS. A conclusion drawn from a summary of symptoms, which forms a basis for prognosis or treatment.

DIFFERENTIAL DIAGNOSIS. A highly specialized diagnosis (q.v.) for purposes of finer distinctions.

DISSOCIATION. Irregularity or abnormality of association trends.

DOLICHOCEPHALY. Long-headedness; used of a cranial index where the length-breadth ratio ranges from .70 to .76.

DOMINANT. Pertaining to a unit character in Mendelian inheritance which is outwardly present in parent or offspring; normality with respect to intelligence as a unit character.

DUPLEX. With respect to intelligence as a unit

character in Mendelian inheritance, a person who is himself normal and is biologically untainted with feeble-mindedness, that is, who is not himself capable of transmitting mental defect.

ETIOLOGY. The study of the causes of a condition.

EVALUATION. Appraisal or interpretation based on a weighing of facts with allowance for accompanying influences.

"FACULTY." One of the separate unit powers of which the mind was formerly thought to be composed; in modern usage one of the modes of behavior of mind as a unit.

FEEBLE-MINDEDNESS. A generic term including all classes of arrested mental development amounting to **IDIOCY**, **IMBECILITY** and **MORONITY** (q.v.); in this book used synonymously with **MENTAL DEFICIENCY**, **MENTAL DEFECT**, **MENTAL DEFECTIVENESS**, and **AMENTIA**; in British terminology a specific term equivalent to **MORONITY** (q.v.); in early American terminology a specific term equivalent to **MORONITY** as well as a generic term for all classes of **IDIOCY**, **IMBECILITY**, and **MORONITY**.

GERM-PLASM. That part of the reproductive germ cells which is the material basis for the transmission of hereditary traits.

GLIOSIS. Excessive development of neuroglia or

glia-cells.

HEMADENOLOGY. The science of the ductless or blood glands.

HYDROCEPHALUS. A condition of the brain characterized by the presence of an undue amount of serous fluid in the brain or cranium.

IDIOCY. The lowest grade of feeble-mindedness; permanent intellectual arrest where the intelligence level seldom exceeds a mental age of 2 years; that degree of mental defect represented by persons who are insensible to danger, who make little use of language, and who attend only imperfectly to their ordinary physiological functions.

IMBECILITY. The intermediate grade of feeble-mindedness; permanent intellectual arrest where the intelligence level is from mental ages of 3 to 7 years inclusive; that degree of mental defect represented by persons who are sensible to danger and who learn to attend to body functions and to perform very simple tasks, but who cannot learn to read or write to any material extent and cannot work without constant supervision.

INFANTILITY. A condition of or tendency toward infantile traits in persons no longer infants; arrested development of structure or function.

INTELLIGENCE. That phase of mental activity

which is essentially characterized by conceptual thinking, reasoning, or judgment as opposed to feeling and will.

INTELLIGENCE AGE. See **MENTAL AGE**. The intelligence level in terms of age standards.

INTELLIGENCE LEVEL. The degree of intellectual development.

INTELLIGENCE QUOTIENT. The ratio of intelligence level (mental age) to life age.

INTELLIGENCE TEST. A mental test (q.v.) which is concerned primarily with the examination of the intelligence.

LESION. Morbid impairment of structure or function.

MACROCEPHALY. Large-headedness; a condition of the cranium characterized by excessive cranial capacity.

MENDELIAN. Pertaining to Mendel's law (q.v.).

MENDEL'S LAW. The law of inheritance discovered by Gregor Mendel, according to which certain traits are transmitted as unit characters according to constant formulas.

MENTAL AGE. Commonly though somewhat loosely used for **INTELLIGENCE AGE** (q.v.); the intelligence level in terms of life age standards. Mental age in this usage does not include the level of all

states of mental activity except in so far as they are co-ordinate with intelligence.

MENTAL DEFECTIVENESS. In common usage synonymous with **FEEBLE-MINDEDNESS** (q.v.); more exactly, imperfect mental constitution of any sort.

MENTAL DEFICIENCY. In common usage synonymous with **FEEBLE-MINDEDNESS** (q.v.); more exactly, mental lack of any sort; in British terminology an exact equivalent of the American **FEEBLE-MINDEDNESS**.

MENTAL DIAGNOSIS. A diagnosis (q.v.) in which mental states are the primary symptoms.

MENTAL FUNCTION. A certain activity of mind or consciousness, more particularly of the intelligence.

MENTAL PROCESS. A certain aspect, power, or faculty of mind or consciousness, more particularly of the intelligence; also a manner of operation of mind; sometimes used synonymously with **MENTAL FUNCTION** (q.v.).

MENTAL TEST. In common usage synonymous with **INTELLIGENCE TEST**; a situation or task employed for the purpose of mental classification or diagnosis; usually such a situation or task which has been standardized with respect to technique or norms.

METABOLISM. The chemical changes in the building up or destruction of living cells in nutrition, growth, or decay.

MICROCEPHALY. Small-headedness; a condition of the cranium characterized by abnormally small cranial capacity.

MONGOLIAN. A clinical variety of feeble-mindedness, usually of imbecile grade, having certain physical resemblances to the Mongolian race, and characterized by certain relatively constant mental and physical traits.

MORONITY. The highest grade of feeble-mindedness; synonymous with the British **FEEBLE-MINDEDNESS**; permanent intellectual arrest where the intelligence level is between mental ages of 8 and approximately 12 years; that degree of feeble-mindedness represented by persons who (a) may learn to read and write to some extent but who profit little from ordinary school instruction beyond the fourth or fifth school grade, (b) may learn to perform relatively simple unskilled industrial tasks with occasional oversight and may be capable of earning a living under favorable conditions but who lack foresight and are incapable of ordinary adaptation to changed conditions, (c) may acquire certain normal habits of action but who lack judgment ("common sense")

and the ordinary powers of resourcefulness, abstract reasoning, and insight.

MORPHOLOGICAL. Pertaining to structural nature and characteristics.

MYXEDEMA. A disease caused by atrophy of the thyroid gland.

NEGATIVISM. An abnormal condition in which a person persistently does the opposite of what he is told or expected to do; used also somewhat loosely of a condition of extreme apathy.

NEOLOGISM. A newly-coined word.

NEUROPATHIC. Tending toward imperfect or morbid constitution or function of the nervous system.

NULLIPLEX. With respect to intelligence as a unit character in Mendelian inheritance, a feeble-minded person.

OBJECTIVE. Characterized by logical conclusions resulting from concrete qualities or exact measurements as opposed to opinions based on inspection, impressions, or theoretical deductions; opposed to **SUBJECTIVE** (q.v.).

OSTEOLOGICAL. Pertaining to the bones of the skeleton.

PATHOLOGICAL. Characterized or caused primarily by disease, injury, or morbid conditions.

PERSEVERATION. Abnormal persistence of response to a stimulus; especially, abnormal immobility of attention resulting in persistence of associations or ideas; used specifically in the association test for certain types of persistent association trends.

PHYSIOLOGICAL. Pertaining to those functions of the body or of living organisms which are concerned with sustaining life.

PHYSIOLOGICAL AGE. The degree of physiological development in terms of age standards.

POTENTIALLY FEEBLE-MINDED. Used of persons who ultimately prove to be feeble-minded but who for the time being do not exhibit intelligence retardation amounting to feeble-mindedness.

POTENTIALLY NORMAL. Used of persons who ultimately prove to be of normal intelligence but who for the time being exhibit some degree of intelligence retardation.

PROGNOSIS. The prediction or estimation of probable changes in a condition, usually based on a summary of symptoms.

PSYCHIATRIST. One versed in the knowledge of those psychopathological states commonly classed as insanity or dementia.

PSYCHOPATHIC. Tending toward pathological mental constitution or function; disordered or un-

stable mental constitution as opposed to simple intelligence deficiency.

PSYCHOPATHOLOGIST. One versed in the knowledge of pathological or abnormal mental states.

PSYCHOPHYSICAL. Pertaining to a combination of mental with physical functions.

RECESSIVE. Pertaining to a unit character in Mendelian inheritance which is absent in parent or offspring; feeble-mindedness with respect to intelligence as a unit character.

"SCATTERING." Used of a type of reaction which is characterized by irregularities or inconsistencies of performance; used specifically of Binet-Simon reactions where an unusually large number of tests are passed beyond the basal year.

SIMPLEX. With respect to intelligence as a unit character in Mendelian inheritance, a person who is himself normal but is biologically tainted with feeble-mindedness, that is, is capable of transmitting mental defect.

SIMULATION. Pretense; the conscious act of feigning.

SLOPE OF THE SMEDLEY OR ANTHROPOMETRIC CURVE. The ratio of the average of the physical percentiles to the average of the psychophysical percentiles for the Smedley group of measurements; the

graph of this ratio.

SMEDLEY CURVE. The graph of the percentiles of the Smedley group of measurements.

SOMATIC. Pertaining to physical as opposed to mental.

STIGMATA OF DEGENERATION. Abnormalities supposed to be signs of biological degeneration and formerly regarded as symptomatic of mental deficiency.

SUBJECT. Used technically for the person being examined.

SUBJECTIVE. Characterized by opinion resulting from inspection or impressions or theoretical deductions as opposed to concrete qualities or exact measurements; opposed to **OBJECTIVE** (q.v.).

SYMPTOMATOLOGY. The science or systematic study of symptoms.

SYNDROME. A group of related symptoms; a symptom-complex.

TAPEINOCEPHALY. Low-headedness; used of a cranial index where the height-breadth ratio is below .92.

UNIT CHARACTER. A mental or physical trait which is biologically transmitted as an hereditary unit according to Mendel's law.

GLOSSARY OF MENTAL TESTS

ABELSON DOT CANCELLATION TEST (1). A cancellation test in which the subject is required to cancel each group of 4 dots from lines made up of groups of 3, 4, and 5 dots in chance order.

ABELSON TAPPING TEST (1). A test in which the subject is required to tap as rapidly as possible with a pencil upon a piece of paper.

ATAXIAGRAPH (45). An apparatus for measuring the amount and direction of body swaying; usually a flexible recording arm, which extends over a recording surface carried on the subject's head.

AUTOMATOGRAPH (45). An apparatus for registering involuntary and unconscious movements, particularly of the hand and arm; usually consists of a plate resting on ball bearings and carrying a recording arm.

BINET-SIMON SCALE. A series of graded tests standardized for the measurement of intelligence in terms of age levels; the tests consist of relatively simple situations, tasks, problems, and questions which are designed to call into activity thinking and

judgment. The Scale has undergone several revisions known as the Binet-Simon 1905 series (5), the Binet-Simon 1908 revision (5), the Binet-Simon 1911 revision (5), the Town translation, the Goddard or Vineland 1910 (38) and 1911 (33) revisions, the Stanford extension and revision (98), the Yerkes-Bridges Point Scale (117), and a number of translations and local revisions of less general acceptance.

BURT DISSECTED PICTURE TEST (9). A picture, cut into rectangular pieces of equal size, is to be reconstructed from the pieces with the aid of an uncut copy of the same picture as a model.

COMBINED MAZE TEST (110). A test in which the subject is required to trace with a pencil between parallel lines of a geometrical design made up of curves and angles.

CURVED MAZE TEST (110). A test in which the subject is required to trace with a pencil between parallel lines of a geometrical design made up of simple curves.

DECROLY PICTURE ARRANGEMENT TEST (17). A set of pictures, which tell a story when arranged in proper sequence, is presented to the subject in disarranged order with the instruction that he put the pictures in proper sequence.

DEMOOR SIZE-WEIGHT ILLUSION (19). Two blocks of identical appearance and size except for length are presented to the subject with the request that he indicate the heavier. The short block is loaded to weigh the same as the long one, but the similarity of aspect induces the illusion that the small block is the heavier.

FORM-BOARD TEST (35, 108). As used in this book specifically the Vineland modification of the form board described by Norsworthy; the test consists in placing ten blocks of different forms into ten corresponding holes as rapidly as possible.

GODDARD ADAPTATION BOARD (32). A rectangular board with four circular holes, one of which is larger than the rest; the subject is required to place a circular block into the one hole which it fits, the larger one, when the board has been turned about in a certain manner.

HEALY PICTORIAL COMPLETION TEST (46). A picture-board which represents a number of situations, with ten concrete elements lacking; the subject is required to find the lacking elements from a set of 45 logical and illogical elements.

HEALY-FERNALD CONSTRUCTION PUZZLE A (47). A test in which the subject is required to fill a rectangular frame with five rectangular blocks of differ-

ent sizes.

HEALY-FERNALD CONSTRUCTION PUZZLE B (47). A form-board test of special design in which cut-out spaces are to be filled with wooden forms which permit of a certain amount of interchanging.

HEALY-FERNALD CONTROLLED TAPPING TEST (47). A tapping test in which one tap is to be made with a pencil in each of 150 squares arranged as a grid.

HEILBRONNER TESTS (30, 48). Sets of partially completed drawings of concrete objects are exposed in order of stages of completion; at the exposure of each uncompleted drawing the subject is required to state what the drawing will be when completed.

KENT-ROSANOFF ASSOCIATION TEST (56). An association test in which the subject is required to speak the first word suggested to him by each of 100 different words; the reactions may be compared with standard frequency tables.

KNOX CUBE TEST (76). A test in which the subject is required to tap each cube in a row of four small cubes following certain combinations indicated successively by the examiner.

MUSCULAR MEMORY TEST. A test designed to measure the extent and accuracy of repeating muscular movements; for example, the subject's arm is

moved a certain distance and then the subject attempts to repeat the movement for an equal distance.

PORTEUS MOTOR-INTELLIGENCE TESTS (78). A series of geometrical outlines of graded complexity; the subject is required to traverse each outline to the first exit without false moves.

SMEDLEY GROUP OF ANTHROPOMETRIC MEASUREMENTS (18). A group of three physical measurements, standing height, sitting height and weight, contrasted with three psychophysical measurements, right grip, left grip and vital capacity, by means of percentile standards.

SOMMER TESTIMONY EXPERIMENT — AUDITORY STIMULUS (87). A brief story is read to the subject, who is then required to reproduce the ideas and to reply to cross-examination.

STERN-SOMMER TESTIMONY EXPERIMENT—VISUAL STIMULUS (96). A colored print of "The Gleaners" is shown to the subject, who is then required to describe the picture and to reply to cross-examination.

TRABUE COMPLETION TESTS (102). Sentences in which certain omitted words are represented by spaces; the subject is required to fill the spaces with words of appropriate meaning.

TRACING TEST. Specifically, as used in this book, the curved and the combined maze tests.

WHIPPLE MIRROR-DRAWING TEST (109). A design in the form of a six-pointed star is reflected from a mirror; the subject is required to trace over the outline of the star guided by the reflection alone.

WHIPPLE STEADINESS TEST (108). A test of motor control in which the subject is required to hold a "needle" in holes of different diameters for a certain length of time without contact.

WOODWORTH AND WELLS FOLLOWING DIRECTIONS TESTS (112). Tests in which the subject is required to carry out certain instructions as indicated in a list of printed directions.

WOODWORTH AND WELLS SUBSTITUTION TEST (112). A test in which five different geometrical forms are represented by numbers according to a key; the subject is required to number a pageful of these forms distributed in irregular order.

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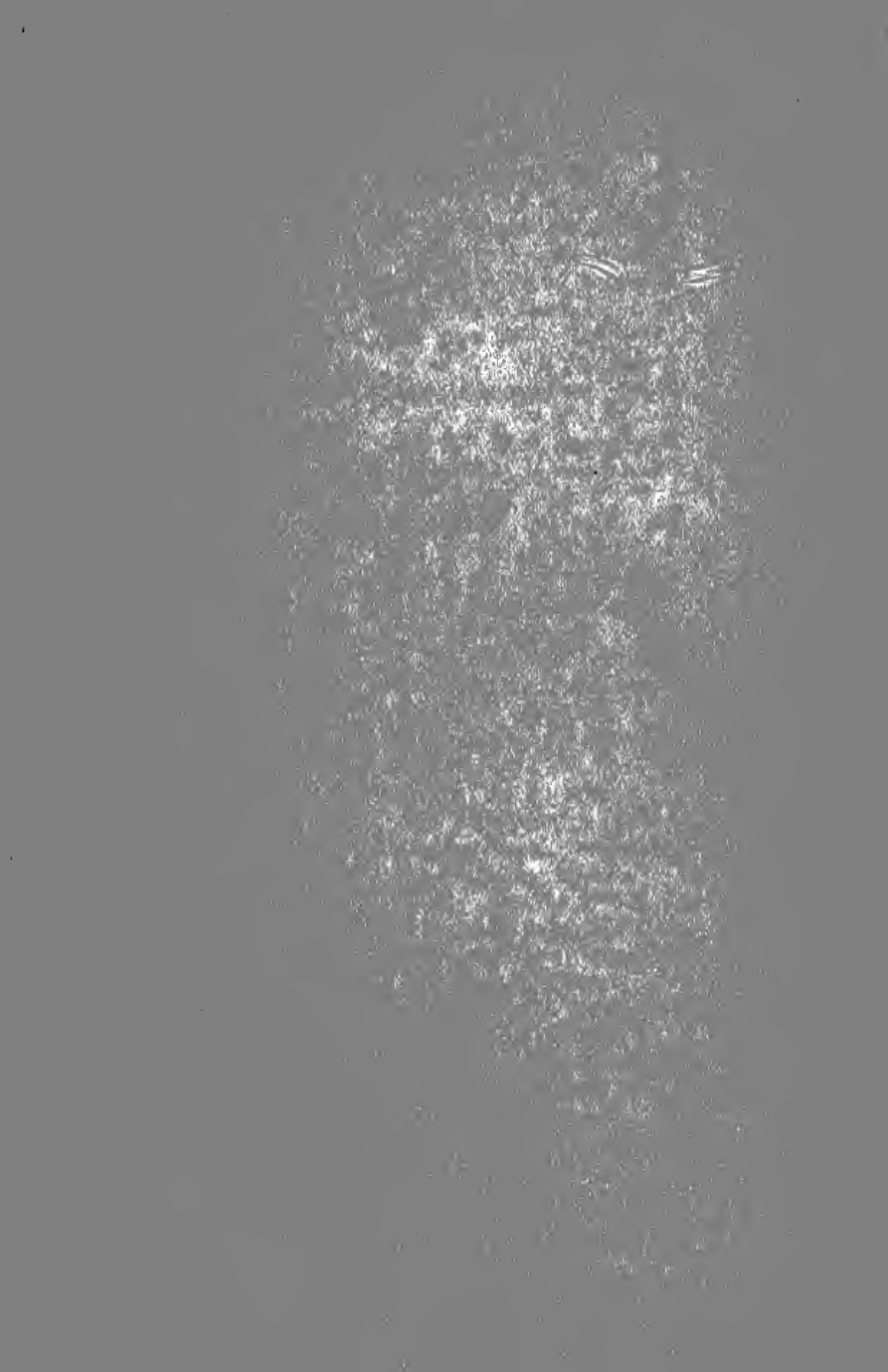
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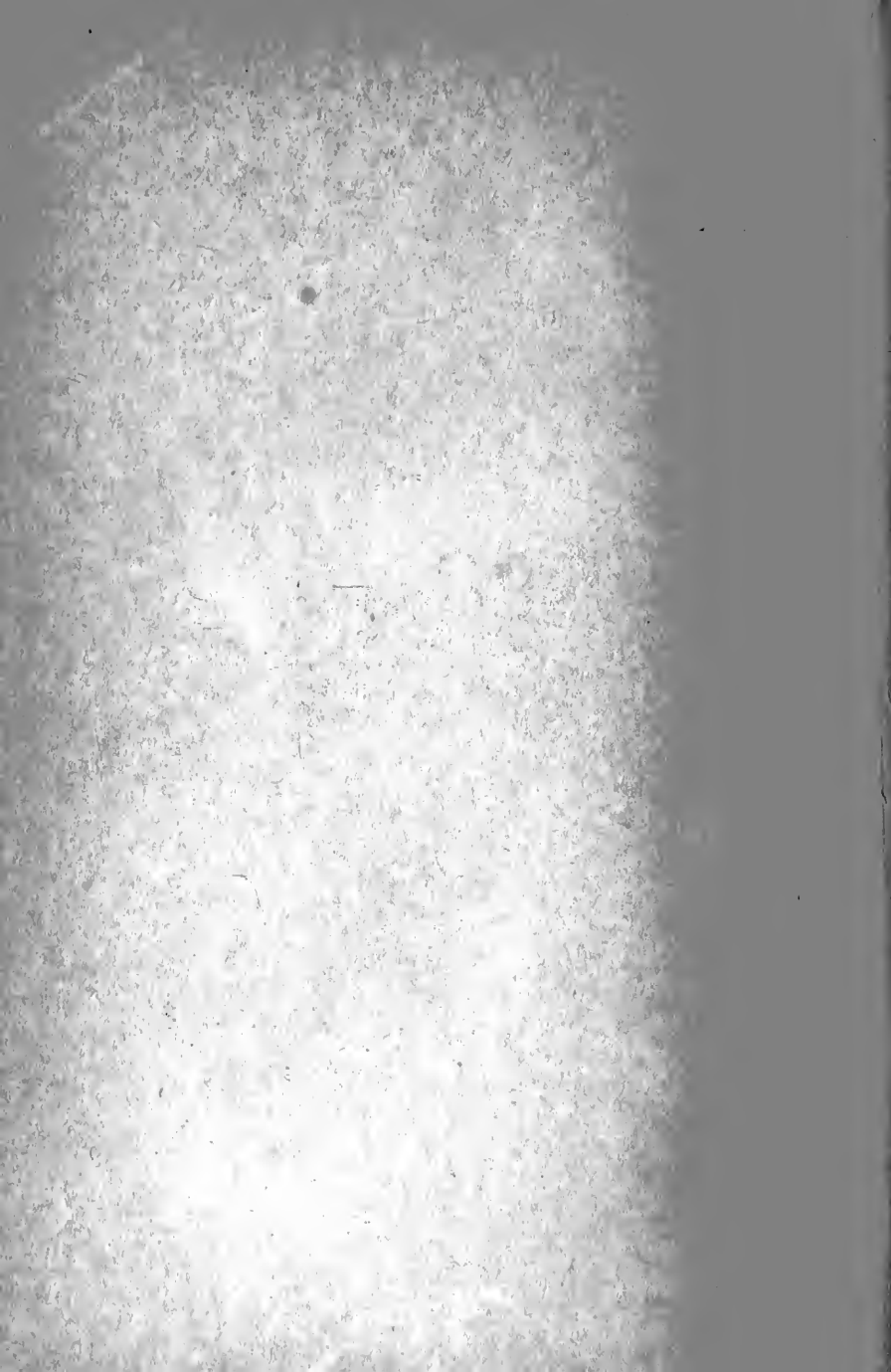
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